THE

SOUTHERN AGRICULTURIST.

APRIL, 1834.

PART I.

ORIGINAL COMMUNICATIONS.

ART. XX.—*On the Culture of Corn; by* JOSEPH E. JENKINS.

Read the before Agricultural Society of St. John's, Colleton, and communicated by them for publication in the Southern Agriculturist.

(Continued from page 122.)

Having thus remarked upon the plant, allow me now, Mr. President, to detail my system, or rather the system pursued in this field in 1832. The mud having been carted into the two lines, at the rate already stated in the summer of 1831, was scattered in the alleys of the old beds in the spring of the year; we at this time carted in the compost, which was strewed along upon the mud (it should have been reversed) at the rate of three baskets to the bed. The cotton-seed was then brought into the field a day or two before we began listing the land, and deposited in heaps of twenty bushels, being a cart-load to the acre; we then listed over our compost and mud, and when we arrived at the portion of field containing the heaps of cotton-seed, each negro was directed, before listing, to strew along the alleys one peck into each, and to cover over with a heavy list. This was to induce an immediate sprouting of the seed, and thus throughout, until we finished our listing. The field being thus listed, we commenced

banking over the compost and mud, in order that the cotton-seed might have time just to crack the ground before we arrived at its portion of the field; for this is the happy period of banking upon it; it is then in a proper state for nourishing the tender roots of the young plants; cover immediately as the first efforts of nature bursts its frail covering, and its aspiring head cleaves the superincumbent earth. It is likewise by this mode of proceeding, that the mechanical action (happily so called by Mr. King) is allowed to take place, as if ten millions of ground-moles had congregated to a merry meeting. The whole list is one continued crack, the young leaves of cotton, here and there, are seen making their appearance and ready to burst the elements of their destined tomb. But this must be prevented: the oleaginous portions of the seed, together with its gaseous principles would be evaporated in the open air; by means of the foliage, and the most material part of the manure, that portion which is to prevent your corn from burning in the drought which commonly occurs in the latter part of June or first of July, would be lost.

Having now banked up the field, (which in my opinion, should not be finished in this climate before the first of May, owing to the drought just spoken of happening when corn that is planted late in March or early in April, is just shooting its tassels and ears, and in that case, as occurred this year, [1832,] doing vast injury;) we proceed to select seed for planting. I have never yet been curious enough, or more likely industrious enough, to make a selection from corn whilst in the field. I am convinced, however, that benefit must arise from the practice of planting none but corn which came from the two or three eared stalks. A gentleman of this island, but not of this Society, informed me, that from the single circumstance of his making such selection, and being careful to exclude every ear that had not at least twelve rows, he had much benefited. That this is so I have no doubt. My practice has been simply to select the largest ears from the corn-house, and to be careful in having them hand-shelled, instead of being shelled by the pestle, that the tender germ might not be injured.

Next we proceed to coating the corn in tar, by throwing into each bushel of corn, about one pint of tar, and stirring with a stick until it is all black and properly covered. It is

afterwards rolled in soot or ashes, and is then fit for the field. The objects to be gained by taring and sooting are, first, to prevent grubs and ground-moles from disturbing the corn before it springs, which they are apt to do, and which even this process does not altogether prevent—and, in the second place, to bar the crow from pulling it up, for which they stand ready as soon as it makes its appearance.—Herein it is very effectual: two or three of the first comers will sometimes take up one or so, but the information is soon spread, and after the first day, a crow seldom or never alights. There remains no necessity for crow-minders, it is but a waste of time. I have none, nor have had for some years, and there is seldom if ever a balk in the field.

We now proceed to planting:—holes are made at the distance of two feet or thereabouts apart, on the top of the bed, and herein are deposited four or five grains of corn, and the planting is finished by a pat of the hoe after properly covering the corn, about three inches with earth taken from the bottom of the alley. I have experienced great advantage from this close method of planting. In the first place, the corn being early reduced, (and the earlier the better,) to a single stalk in the hill, has no competitor for the quantum of manure which lies within its precincts of two feet. In the second place, the space from corn to corn being so limited, every particle of manure, will, in time, be reached by the searching roots of either the one or the other, and will be fed upon and taken up for their support. In the third place, the contiguity of the corn, when grown to any considerable height, with its dark leaves intermingling, forms a northern climate; but little sun being able to penetrate to its roots, a delightful coolness is ever present, and the dews of the morning are retained to a later period of the day, which, in itself, is of vast importance

The philosophy of this last effect deserves some consideration. It is an agricultural admission, that the corn of the Northern and Western States, is more productive than it is or can be made with us; this circumstance arises not from the superior strength of their land, so much, or from the superior quality of their manure (for I have made lands as powerful by having a compost-pen removed, as can possibly be effected in any portion of the world) as from the greater coolness of their nights, whereby the sun, though excessively hot at mid-day, is longer in warming them in the morn-

ing, and the early return of coolness in the evening prevents the effects of scalding as with us: they likewise are in the habit of leaving a greater number of stalks on the bed, (or one hundred and five feet) than we are, greatly contributing to similar cooling effects, as remarked in my fields before. I have read of an extraordinary yield of a crop of corn, the same being planted at the distance of but five inches upon the bed. At all events, I think, as yet, that the planting of corn at two feet, is an improvement, and would recommend a partial trial if no more; to all who have manure of cotton-seed and high poor land. This cotton-seed may be considered as but the offals of our cotton crops, which, being thus appropriated, leaves in the possession and at the disposal of the planter, the whole amount of his year's gathering of compost and mud, the more of which being applied to his cotton crop the greater will be its yield, and the greater its yield the heavier will be the quantum of seed, to the benefit of the corn.

I know, Mr. President, that cotton-seed is a valuable manure, apply it to whatever vegetable you may; but Sir, when we consider its results in the corn-field, its incomparable results, as is evidenced in the certificates of Messrs. Thomas Bailey and Micah Jenkins, which I shall beg leave to lay before to you, I am constrained to think it wasteful, when it is applied elsewhere. If injudiciously applied to cotton, it is apt to overstretch it, in a wet season; and in root potatoes, I have known it to run them into extravagant vines, whilst the product was beggerly in the extreme. Thus it requires care, knowledge, caution, and seasons, to make it effectual in eieither of these. But Sir, in corn, I defy any man to injure, by over manuring with it, and yet, but the slender quantity of one peck to the row is, as you will perceive by the certificates, advantageous in the highest degree. Mr. Bailey says, "In 1829, I planted some very 'poor land in corn, and made about five bushels to the 'acre. In 1830, I planted the same land again, manured 'with a peck of cotton-seed to the row, (after the discovery 'of Mr. James King,) and the very same land yielded me 'twenty bushels of corn to the acre."

Mr. Jenkins, has these words, "I do certify, that in the 'year 1830, I planted in the centre of my corn-field two acres

'after the manner recommended by Mr. James King, that 'is to say, one peck of cotton-seed was strewn in the alley 'of each bed before listing, and listed and beded over, and 'the production of the said two acres was double that of 'any other two acres in the field, although some portions 'of said field was manured well with compost from the 'cow-pen."

These certificates speak for themselves, the gentlemen are well known as members of this community.

Now, Gentlemen, one word with regard to Indian corn as food for man, and a few general reflections shall close my remarks. Our experience shews it to be strengthening and healthful, and the wide extent of country over which it is cultivated, proves it, as the Indians called it, the "great gift." Taking, then, (with this truth fresh upon our minds,) a philosophical view of the vegetable kingdom, our attention cannot but be arrested by the important feature in the regulation of the economy of nature, that those which are intended for the healthful subsistance of man, are presented to him in their production over a greater extent of space, whilst those which contribute merely to his luxury or taste, are confined in narrower limits. Pursuing the thought, should we extend the map of the world before us, we could trace with accurate precision, the date, the citron, the orange, the rice, the wheat, the apple, &c. all within the respective latitudes, and only within their respective latitudes coming to perfection, if we remove them even to the North or to the South a degree or so too far, how unsatisfactory, how laborious is their culture, the hot-house must shield them from the rude blast of winter, or an umbrageous shelter protect them from the scorching sun; and Sir, when, after days and nights of labour and expense, the fruit long hoped for, is developed, and fancy luxuriates in the expectation of enjoyment, what have you? "Stale sick and unprofitable it palls upon the taste," nature curtailed denies the rich juice, the balmy nectarine flavour, the aromatic odour, and in her stead you have made for yourself a substance, wanting a name, but to the eye, a substance over which affection smacks the lips, whilst a hideous grimace distorts the countenance in disgust. How more important then, than almost any vegetable that grows, is the Indian corn. In whatever climate it has as yet been introduced, in whatever portion of the world it has as yet been cultivat-

ed, it comes, or it can be brought to perfection; care only being had to the selection of the proper varieties, for its species, I believe, to be universal. Again in how many various confections and cakes can it be presented upon our tables; all excellent of their kind. I have tasted the common hoecake with satisfaction, and who cannot recall the delightful relish of the corn-flour pound-cake? To my palate there is no substance in the world comparable to it in the composition of that delicious morsel. Wheat sinks into perfect insignificence, when compared with it, either for substantiality or flavour; and, gentlemen, if there is one of you who has not been so fortunate as to have tasted of this king of cakes, take my advice, have a pan baked as soon as you return home, and invite your friends to rejoice with you in having found that which was lost.

Mr. President, I shall now close with a few remarks, which I trust will prove an encouragement to the members of our Society, to give us unhesitatingly the unbiased reflections of their minds, regardless of the sneers of folly, or the foul detractions of envy. It has ever been the fate of merit to attract the one or the other; and when a Phidias, in the most enlightened age of antiquity, and the most polished city of Greece, could not escape feeling their effects after the production of his master-piece in statuary, they must be expected but as the natural sequents of deserving thanks. "That to plant well is better than to theorize well," is an apothem which has been made an instrument of more mischief than any two-edged sword, and at its general acceptation, we should not be astonished as it is so easily accounted for. It is easy for the most ignorant clod-hopper to call himself a planter and no theorist, as if he thereby conferred upon himself some honourable distinction whilst he heaped upon the head of his neighbour, (whose mind elucidates his practice, and who is not unwilling that the world should share with him whatsoever of good he can impart) coals of fire and molten lead. I say, Sir, that this wretched apothem, got up in the days of ignorance and maintained by her children ever since, has been of incalculable disadvantage. Modest merit too often shrinks before it. Let it be asserted, and asserted without the fear of contradiction, that theory is the incipiency of all acts;—that the first clod of earth that was ever designedly broken for the introduction of seed with the intention of

reaping its production, was the effect of speculation and of mental arrangement. Can it be denied? As well, Sir, may be denied at once, all improvement in the science of Agriculture, all the important effects of chemical analysis, all the advancement in mechanical facilities which the world enjoys, and which these enjoy, ignorant of their source—are they not all effects of the same cause? What is that cause? Mind—yes it is the privilege of mind, to catch the ephemeral fancy; improve upon its hint; trace it through the vast field of speculation; curtail its excentricities, and bring it into successful practical operation. Check this, and the world stands still; improvements cease; Cimmerian darkness, as of old, cover the face of the earth; the gorgons dire, Superstition and Folly hold it in their chains and man returns to barbarism. Look around you, Mr. President, it is time that we should awake. Why, and I ask it seriously, why is it, Sir, that whilst it is the pride and glory of the practitioners of other arts and sciences to give their talents and labour to their advancement, not only as to usefulness, but as to embellishment; to attract, Sir, by the fine polish of science, the eye of taste to the examination of the rich fruits, which successful theory might have collected in their several departments; in Agriculture, the mother of them all, the nourisher and supporter of all arts, the cap-stone of excellence in science, the first and last in importance; to attempt improvement by the investigation of causes not apparent to the superficial observer; to trace back effects to the first origin; indeed, Sir, to innovate at all upon the practice of gone-by-days, is considered as wild speculation and abominable theory? Is it that we are cursed with too many John Blunts of Bulwar? or is it not; and can our profession sit silent under the stigma? Is it not, Sir; because apathy in those, who should be her guardians, still allows, ignorance thus to chain down science, by the degradation of that which is in itself the evidence of excellence? Sir, to be able to speculate, proves a scrutinizing faculty; and to theorize to success, the highest mental endowment. Chased, therefore, before the ameliorating influence of progressive light, like Milton's devil, it must fly, howling. The best as well as the wisest of men have not disdained to step forward in defence of once degraded Agriculture; to elucidate by laborious study the hidden mysteries of its science, and to drag to light, by

giant mind, its rich, long buried stores of information. And shall we, gentlemen, the members of an enlightened Society, the natives of a State, whose elevation in this Union has been the effect of the radiating influence of scicnce shed around by her sons; of whom, not only she, but the day is approaching when America shall be proud. Shall we be driven back from the performance of our duty by the hackneyed vulgarism, this crooked finger of folly? Forbid it heaven, and forbid it patriotism. No, my countrymen, ours is the proudest destiny upon earth, did we but feel it as we should. Occupying a position in society the most independent, engaged in a pursuit the most liberal, in the performance of which we need call none, but the Ruler of the Universe, master, it is ours to crush the vampire of the mind, and set our calling free. It is ours, to cheer by our smiles, and to exhilarate by our approbation, him who, on this altar of our common good, makes a sacrifice, either of inclination, of ambition, or of the avarice of secrecy. And is there one here who would not contribute? Is there one here, whose selfishness would still conceal in some hidden recess of a narrow soul, *that* by the devulgement of which he should fear, not his own loss but his neighbour's profit? No, my friends, I trust not one. We all feel that it would be derogatory to indulge this base, this groveling, this niggardly propensity; and whilst we shall still emulate each other in the fair field of competition and lawfully strive to excell, whilst we shall hold it honourable to be first in our profession, most industrious, most skillful, most successful, we shall banish all agricultural jealousies which "would lock our country to our friends," and by stretching forth the hand, save the inexperienced many a step to be repented of. Let us fear not; whilst there is diversity in the human features, there will be diversity in human fortunes—the best cultivated fields will be the most productive, and deserved distinction will crown the efforts of the most industrious and persevering.

ART. XXI.—*On the Causes of the general Unsuccessfulness of the Sea-Island Planters; by* WHITEMARSH B. SEABROOK.

"Charleston, February, 25, 1833.

Dear Sir,—Having published the extract from my correspondence with the Hon. W. B. Seabrook, which I sent you some time since, I herewith send you his reply to some queries propounded to him, as to the cause of the want of success of the Sea-Island Planters, believing that it will prove equally as acceptable to your readers.

I remain, yours, &c.

J. J. S.

EXTRACT.

Query.—"What are the causes of the general unsuccessfulness of the Sea-Island Planter?

Answer.—In my opinion the most prominent are,

1st. Absence in the summer months.

2d. The want of strict personal supervision when the Planter is at home.

3d. Over-planting.

4th. Ignorance.

Perhaps nothing hath operated more signally against the planting interest, and against Agriculture in general, than the belief too commonly entertained, that to ensure success in our calling, a little practical knowledge is all that is necessary: and, it has often been remarked, that if a young man be unfit for any other employment, he is duly qualified for the profession of the planter. Where this opinion exists, Agriculture is in a low condition, and the mind has scarcely soared to the point of common reflection. As a science, the comprehensiveness and importance of Agriculture and rural economy are universally acknowledged. As an art, no avocation requires more unwearied assiduity and personal attention. The great mass of our overseers, although they may be diligent and faithful, yet, being without education, they cannot methodize, and are utterly incapable of determing the true means of economizing labour and time—a matter of immense moment to the agriculturist. On every plantation, there

is a regular organized government, whose powers are in the hands of the master or overseer. The mere statement of this point is enough to shew, that something more than practical information is needed by him, who exercises, in his own person, all the high functions of an unlimited monarch. On the proper administration of the government depends, not only the discipline of his people, but the profits of the crop of the planter. If, as a body, (for I take pleasure in saying there are many exceptions,) overseers, from causes not ascribable to them, are incapable of advantageously superintending the multifarious concerns of a plantation, how much more incompetent must the black man be. He can obey orders, he may know how to hoe—how to construct a ditch—where the spots are that require manure;—but when to hoe and when to haul, or to do neither—what kinds and quantity of manure ought to be placed on particular soils—how to profit by contingencies—what quantum of labou can be performed with facility in the shortest time; and, in general, with reference to whatever requires observation and reflection, you will find your Driver to be profoundly ignorant. A negro has no idea of providing for the future, or guarding against casualties. His thoughts are limited to the present—he never thinks of to-morrow. From these considerations, it is obvious, that whoever is compelled to quit his plantation, although it may be only for a month, will experience some derangement, if not a positive loss in his affairs. As no rules are to be followed at all times, the master cannot give orders from home. His interest, therefore, and it not unfrequently happens that the interest of an entire parish, is entrusted to men inexperienced and otherwise ignorant of the various duties of their calling; or to incompetent Africans. Let the latter be as faithful and as industrious as you may desire, still, there will always be discernable, on every place under their immediate control, the absence of method and arrangement, and the neglect of all those little matters which go to make up the whole on which, prosperity depends. There is but one remedy for this evil. Overseering should be made a profession, and one too of high character. Young men should be educated with a view to the duties of the plantation, and subsequently be bound as apprentices to experienced planters. If we had a class of such

citizens, they would revolutionize the agriculture of South-Carolina. Union among our Societies, and the patronage of the Legislature would soon be instrumental in attaining this end. As a preliminary point, let a Professorship of Agriculture be established in our College at Columbia. Agricultural Schools would soon follow.

2. When at home, the planter should not be satisfied with giving orders, he must *see* them executed. His eye should rest repeatedly on every object necessary to the accomplishment of the day's labour. He should at least witness the beginning and the end of his work. By this system he will be sure of pleasing himself, and of satisfying his labourers; and, above all, the necessity of frequent punishments will be avoided. There is nothing more encouraging to a slave than to know, that in his master's judgment, he was doing or had actually performed his task well.

It is, indeed, surprising that the advantages of personal supervision by the planter, should be so slightly estimated. Does he reflect that in his person are centred executive, legislative, and judicial powers? That he is amenable for the proper discipline of his people, and that the safety of the State materially depends on the manner in which his little government is administered? Does he not know that no one can be found as true to him, as he himself? Has he not often felt the necessity of ascertaining precisely what has been done by each labourer in the course of the day? Arrangements are to be made for the ensuing year—plans to be executed, and particular experiments tried. How can these things be done advantageously without a thorough knowledge of the actual condition of your affairs? In no other way can you derive the greatest benefit from a judicious division of labour, and exact a strict accountability on the part of the executors of your will. To you, my dear Sir, who are an experienced farmer, I need say no more, on the interesting subject. For the duty you have enjoined on me, may I ask as the requital, that you furnish me with a statement of the manner in which you conduct the business of your farm; how you apportion labour among your slaves; and what constitutes the essential characteristics of your police system? Again, for on this subject, I am sure you have a valuable stock of information, tell me in what way can the profits of the plan-

ter be most profitably disbursed, supposing that he intends to expend them in increasing the value of his planting interests?

3. One of the most prominent evils under which Southern Agriculture labours, is over-planting. If practice be a sure criterion of the general belief on this subject, it would seem to be that, the greater the space under cultivation, to a given number of workmen, the greater the profit; an unsound principle, and rarely unattended by injurious consequences. If the soil required no manure—if the aid of the hoe or plough was uncalled for—and, in general, if it was only necessary to sow and then to reap, scarcely too large a crop could be planted. But where, as is the case with cotton, so much depends on the proper preparation of the land and its judicious culture, there is a limit beyond which no considerations should induce you to pass. Let me bring this matter plainly to your view, and briefly unfold the curses (I must use a strong word) of over-planting, as exemplified in the case of A. In the first place, he manures but a portion of his field—his ditches and fences, for the want of time, are never in order—the bedding of his land is done in a hurry, and consequently badly done—he plants a week, or perhaps a fortnight after his neighbours—his hoeings are carried on roughly and imperfectly. If here questioned as to the slovenness of his work, he not unfrequently answers in high dudgeon, what can I do? You see that I cannot be particular. At this stage of his business, two or three of his negroes are reported to him as sick, or, perhaps, from severe labour, as having absconded. Now, in truth, do his troubles commence. He frets and scolds by day, and dreams at night of his great misfortunes. The cotton of A. grows so rapidly that he is obliged to take out too many stalks. To remedy this error he falls into a much greater one, by hauling a large quantity of earth to the plants. At the second thinning he very injudiciously reduces his crop as low as his neighbours, who, perhaps, are engaged in their fourth working. The slip season arrives, but he cannot embrace it. In order that he might exhibit a clear field, he carries his hoeings to the middle of July or later: and thus, to please the public eye, he knowingly inflicts a positive injury on his prospects. Without following A. any further in his unenviable agricultural course, I pray you to look for a

moment at B. the cautious, prudent, and successful cultivator. At the beginning of the year he makes these calculations: that the labour of one slave to every twenty-five would be lost for the season from sickness—that death would in all probability deprive him of one of his workers, and by rain he would lose three or four days before the crop could be harvested. Presuming that these events would happen, he makes his arrangements accordingly. B. now begins his business in time—he is from no cause ever compelled to over-task his people. On this point, as on every other, his mind is tranquil, and his negroes work with zeal and cheerfulness: their industry is stimulated too by the powerful incentive of having two or three days allotted to them for the cultivation of their own crops. Shall I again refer to A.? You will find him always in a bad humour and always complaining. His people labour reluctantly—the scene before them is cheerless; and, having no corn in the ground, they know that they must either be deprived of their usual comforts, or get them by stealth. To aid him in his work, A. orders into the field his carpenter, his coachman, and, perhaps, his gardener. If, at this period, his buildings need repairs, or, if having no work, he could hire his carpenter for one dollar a day—if his horses suffer for the want of the curry-comb, and his vegetables be covered with grass; yet, what are all these disadvantages and inconveniences, says he, temporary as they are, when compared with the loss incurred from a grassy field?

Need I now say to you, my dear Sir, that the conduct and feelings and practices of A. are signally exemplified in the persons of many hundreds of the planters of this State; and what may I ask are the consequences that flow from the system I have attempted to pourtray; or rather, how are the individuals, who imitate the example of A., remunerated for their toil and vexations? By increased productions? No. The harvest in almost every instance is smaller than it would have been had the course of B. been followed. I speak on this subject experimentally, and from personal observation. If, therefore, you value your own interest, und wish to further the great cause of Southern Agriculture, admonish your fellow-labourers and practice yourself upon the admonition, never to exceed the boundary within which experience has

taught us our plantings should be confined. I presume, now, that you are prepared for the question as to how much land may be most profitably cultivated to each full labourer. Five acres should never be exceeded. The true maximum, however, in my judgment, is 4¾ acres, viz. 3¼ acres of cotton, 1 acre of corn, ¾ of a task* of root potatoes and 1¼ task of slips.

4. By ignorance, I here mean an unacquaintance with an important branch of Agriculture—manures. Vegetable matter in a crude state or decomposed in the cattle-pen, is thrown indiscriminately on every description of soil, and in like quantities. This is a capital error, and is one prominent cause of the unsuccess of many of our industrious planters. As I would not presume to instruct you on the principles applicable to manures, or the analysis of soils, allow me to communicate to yon my experience and that of the planters of this place. Briefly, then: for low grounds, especially if the soil be dark, live cotton-seed under the list, at the rate of from one to two pecks to the row, the latter never to be exceeded, constitutes the most valuable manure with which I am acquainted. 2. Compost from the stable or cow-pen—five or six loads to the task; and which, to avoid the loss by evaporatiou, *should be listed in as fast as taken out.* If about ten loads of dry mud could be added to each task, the benefits would be very considerable: nay, caterpillars and storms aside, a profitable harvest would certainly be realized. For *light, high and sandy* soils, marsh or rushes cut green and listed in, in the summer, or winter, at the rate of five cart loads to the task, and *no more.* If the listing takes place in the summer, a favourite measure with me, a large bottom crop and healthy plants may be confidently anticipated:—if in winter, you may calculate on fine pickings from the middle and top fruit. Remember, that green marsh is unfit for any other soil, save that which I have mentioned. 2. *Dry* salt mud. The first year, a cart-load to every row—afterwards ten loads to the task will answer. Where the land is poor, a dressing from the cow-pen of twenty loads to the acre will be necessary. There are strong objections to the use of stimulating manure on light soils unaccompanied by mud. It subjects the crops

* *Task*—one-fourth of an acre.

to perpetual changes. At one time the plants are two luxuriant, and again too much burnt. Dry weather stunts them, and one heavy shower gives them a new growth; by which a large portion of the fruit is lost. Mud corrects this propensity. 3. Pine trash listed in, in the summer, aided by mud in the proportion of from ten to fifteen loads to the task. In passing, I would remark, that the stimulating manures, whether of cotton-seed, or from the stable or cattle-pen, should be scattered broad-cast *under* the list.

For land neither high nor low, and the soil of which is close, any stimulating manure will answer, (except marsh) especially if assisted with mud. Green marsh, unless used for very light soils, has a tendency to generate what is technically called blue and flaggy cotton.

In conclusion, it may be necessary to state, that by a cart load, I mean as much as one horse or strong mule can conveniently pull."

ART. XXII.—*Suggestions relative to the use of Ashes of Salt-Marsh as a Manure; by* N. HERBEMONT.

"Columbia, (S. C.) December 2, 1833.

Dear Sir,—It would be very idle, at this time of day, to say to the public that manure is an improver of land, and that we should attend to this in *our Agricultural country;* but it may not be unless to point out one of the most abundant sources of manure in this country, which has been almost, if not altogether neglected.

In Holland, and the neighbouring countries a manure is prepared of such a value that it is a very considerable article of commerce, and is transported, even by land carriage, to a very great distance, probable one hundred miles or more. A proof of the value of this manure is, that it has been in use, and thus carried abroad for a century, or probably a much longer period, and that it still continues to be used more and more extensively. An

other proof of its value is that a person in the Netherlands has lately formed an establishment to compound a manure in imitation of the "*Dutch ashes*," (the manure here alluded to) and has obtained a patent. His compound is made of refuse bituminous pit-coal with common salt, and I think carbonate of lime. These ingredients being reduced to a coarse powder are made into something, in the form of bricks and burnt, when it readily falls to powder again, and thus forms the imitation of the "*Dutch ashes*," and he even pretends that the improving properties of his ashes are superior to those of his model. The "Dutch ashes," called, in France, "*Cendres de mer*," (sea-ashes) are procured by burning *peat* which is *salt* or *brackish*. These ashes are found very beneficial in most kinds of crops, and are, as I have stated above, carried to a very great distance, perhaps to a greater than any other manure in any part of the world. This is an indubitable proof of the very high estimation in which it is held. Now, I have said that we have most abundantly the materials for it.

What is the peat which is so valuable in Holland, and in what does it differ from our *salt-marsh*? It seems to me that the peat of Holland was once salt-marsh, like those every where on low flat lands bordering on the sea, and that the greater decomposition of the vegetable matter that composes it can be the only, or at least, the chief difference between them. Now, it is very doubtful whether this peat is superior to newer salt-marsh for the purpose of being converted into ashes for agricultural uses. The salt-marshes contain the same vegetable and animal matter, the same earths, salt, shells, &c. as are most probably to be found in the Holland peat. We have, then, on our sea-board, and for a considerable distance inland, a most inexhaustible source, not only of manure, but of wealth, to the enterprising persons who would make it a business to dig and burn this matter, and thousands of boat loads might be sent yearly as high up the country as the navigation of our river would permit, or as far as our rail-roads may extend. Surely, whatever is so highly valued in Europe must possess a relative value here, and what can be more desirable in *this country* than to render our cultivated land more fertile, instead of being turned out as old fields, which are a disgrace to any agricultural country? Situated as I am in the centre of the State, it

is distressing to witness the continual emigration of our citizens to the new States, by which the prosperity, the wealth and welfare of the State must necessarily be impaired. With all the means within ourselves of rendering our country a real earthly paradise, shall we suffer it become a desert? Will no patriotic gentleman make some exertions to prevent this by giving the most valuable example by which they, their posterity, and their country may be not only saved from nearly utter ruin; but improved in wealth, population and power? Our climate and country are generally healthy, some of our soil is very fertile, the whole susceptible of improvement, and, to attain this most important object, scarcely any thing more is necessary than to will it. I assert it without fear of efficient contradiction, that the territory of South-Carolina, by its aptitude for agriculture and commerce, is, or may be rendered adequate to the support, in abundance and happiness, of a population at least tenfold its present one—and yet it is suffered to dwindle to a mere wilderness.

I am, very respectfully, dear Sir, your obedient servant,

N. HERBEMONT.

[The subject alluded to by Mr. Herbemont, is certainly one of considerable importance, and deserves the serious attention of all the planters on the seaboard, to whom the agricultural community must necessarily look for experiments and information. The value of this manure, to the interior, may prove hereafter very great, and its manufacture the source of considerable income to such as may choose to embark in it. For the further information of our readers, we copy from the *Farmer's Register*, the following extract from Sir John Sinclair's *Agricultural State of the Netherlands*, together with the Editor's remarks.]—*Ed. So. Agr.*

The Use and Value of Dutch Ashes, as a Manure for Clover.

[The remarkable manure described in the following extract was referred to in the Abbe Mann's Observations on the Agriculture of the Netherlands, (which is one of the selections given in the second number of the Farmers' Register,) and it is so important a means of improvement, in that admirably cultivated country, that every one who wishes to know the features of Flemish husbandry, ought to be more particularly informed of the nature

and composition of *Dutch ashes.* Our latest information with regard to the agriculture of Belgium, shows that an artificial compound manure has been invented by M. Hollert, formed of certain proportions of lime, clay, pit coal, salt, &c. which after being burnt, is considered similar in chemical composition, and equal in value, to the Dutch ashes. The sulphate and carbonate of lime, (gypsum and calcareous earth,) which are ingredients of the Dutch ashes, must constitute their principle value as manure. M. Hollert's scheme of a substitute, may be visionary: but nevertheless, it may be true, that cheap materials may be presented by nature, in this country as well as in Belgium, which may be so mixed, as to yield the same chemical results and proportions, and produce the like effects, as this valuable manure.—*Farmers' Reg.*]

"For a number of years past, the crops of clover in England have gradually become more and more deficient, and the crops of wheat sown after the clover, have frequently failed. It was supposed, that from two frequent repetition, the ground had become tired of clover, and that the same success in cultivating it could not be expected. The failure of the crop of wheat afterwards was peculiarly unfortunate, and certainly greatly contributed to the scarcities which have of late prevailed in this country. I was much gratified therefore to find, that in Flanders there were no complaints of the failure of the crop of clover, (except in one district, where a plant, called the orobanche, infested the ground,) and that the crop of wheat, after clover, was reckoned among the surest of any. It was still more satisfactory to ascertain, that the means of obtaining similar results, were distinctly known, were not expensive, and could easily be procured in England, being nothing but the application of Dutch ashes.

"According to the best information I have hitherto been able to obtain, there are too sorts of turf or peat in Holland. The first is found on rising grounds, and in a sandy soil, at from three to twelve feet from the surface, the strata varying from eighteen inches to three or four feet in depth. This sort is principally found in Friesland. It is cut and prepared in the same manner as the peat of Scotland and Ireland, burns quickly and cheerfully, gives a good heat, but leaves only a very light ash, of little value. The other sort of peat, which is more generally used in Holland, is extracted from the marshes, which are constantly covered, during the winter season, with water of a *brackish* nature; after this peat is reduced to a pulp, it is spread upon the ground, and when it has acquired a certain consistency, it is cut and dried in the same manner as the former. It burns less clear, and gives less heat than the other peat, but it lasts longer, and leaves a much heavier ash, full of saline matter, insomuch that it is sometimes used as a substitute for soda, in the manufacture of green glass. This can only be accounted for by the effects of the

water by which it is covered, which not only deposits a muddy substance, whence the rich part of the ashes is derived, but the water being of a brackish quality, it impregnates the peat with salts.

"These ashes were analysed about fifty years ago, when it appeared from one-ninth to one-twelfth part consisted of glauber and marine salts.* In a recent analysis by Professor Brande, of the Royal Institution, the contents of the specimen given him were as follows:—

"Silicious earth - - - - -	32
Sulphate of lime, - - - - -	12
Sulphate and muriate of soda, - -	6
Carbonate of lime, - - - -	40
Oxide of iron, - - - - -	3
	93
Impurities and loss - - - -	7
	100

"In such an article, however, the variety of substances to be found in it must be very great, and in different proportions.

"In every part of the interior of Flanders these Dutch ashes are used for clover, and with a success hardly to be credited. They are brought to Brussels by a canal, and thence are conveyed, by *land carriage*, to the distance of from 50 to even 100 miles. Wherever they are used, there is no complaint of any deficiency either in the crop of clover, or of the wheat afterwards. Some instances of their success, it may be proper to specify.

"Mr. Mosselman, a great farmer at Chenoi, near Wavre, assured me, that without the ashes of Holland, he could neither have a crop of clover, nor of wheat afterwards; and that wheat, after clover, *munured with Dutch ashes*, was the most certain crop of any.

"Mr. Hanelot, near Fleurus, declares, that he sows upon clover twenty-five cuvelles of Dutch ashes per hectare; (about nineteen bushels per English acre;) that no manure, though it were to be given in greater quantities, and at more expense, would equal it in strength; that after sowing these Dutch ashes, they always have two great crops of clover, besides pasturage afterwards; and that the next crop of wheat is not more injured by insects, than the other crops of that grain.

* See Mémoires de l'Academie de Bruxelles, Tome III. p. 47, where there is a paper written by the Abbé Marci, read on the 13th of December, 1775, on the subject of artificial manures and stating the advantage of using these Dutch ashes, as being then well known.

"Observing a great heap of dung in a field near Baulet, I inquired of Mr. Grossjean, the farmer who accompanied me, what it was intended for. He answered, that it belonged to another farmer, who thought to render the use of Dutch ashes unnecessary, by spreading a great quantity of dung on his young clover during the winter, and collecting it in the spring to carry it to another field; but there was no comparison between the clover where the Dutch ashes had been applied, and the field that had been covered with the dung, the former being much forwarder, and in every respect superior.

"Mr. Vandoorslair, in the Pays de Waes, informs me, that this manure is used with great benefit where clover is kept for a second year, whether for cutting or pasture, and its advantage, where that practice is adopted, would be incalculable, as the second year's crop is of little value at present.

"It is unnecessary, however, to dwell more on individual opinions, when eighty-three practical farmers in the neighbourhood of Fleurus, have joined in a public declaration to the following effect:—"All our farmers know by experience, that when clover is not manured at the rate of twenty-five cuvelles of Dutch ashes per bonnier, the following crop (of wheat) is very bad, notwithstanding any culture that can be given to the soil, whereas they always have an excellent crop of wheat after clover, and, doubtless, in proportion to the quantity of manure above mentioned being used." The farmers who have subscribed this declaration, must have been deeply impressed with the importance of these ashes; for, in general, they must have brought them from 40 to 50 miles, by land carriage, from wharf on the canal of Brussels.

"These circumstances astonish me more than any thing I had met with in the whole course of my excursion. The advantages of Dutch ashes have been long known on the continent; and though it would be as easy to import them into England or Scotland, as into Flanders, it does not appear to have been ever thought of, or tried; and on my return to England, on the 22d of April last, the crops of clover in Kent seemed to me from a fortnight to three weeks behind, in regard to maturity, and greatly inferior in point of produce, to those I have seen on the continent; which, I am persuaded, was entirely owing to the use of these ashes.

"Upon inquiring into the price of these ashes at Brussels, I found it was one frank fifty centimes per hectolitre, (about 5*d* sterling per bushel;) that it required 16 hectolitres (about 47 bushels) par hectare, containing rather less than three English acres. The quantity, therefore, is about eighteen or nineteen bushels per acre, or from 7*s*. to 8*s*. besides the carriage.

"Mr. Ferrier, the British Consul at Rotterdam, (whose ready attention to my inquiries I acknowlege with much pleasure,) informs me, that the price at Rotterdam was seven stivers per 100

pounds, Dutch weight; and including all expenses, that it would come to about twelve stivers, which, at the present rate of exchange, is about 1*s.* 4*d.* per 100 pounds weight, delivered free on board. The freight per ton of 2240 pounds, would be about 2*l.* to London, and perhaps 2*l.* 10*s.* to Leith. The expense, on the whole, would not probably exceed from 10*s.* to 15*s.* per acre, freight included.*

"Dutch ashes are used for various purposes, besides as a manure for clover. Some farmers spread them on the ground where they have sown turnips or carrots, passing a harrow over the surface, and thus destroying the insect which injure those plants. These ashes are likewise sown on rye in October, on wheat and pasture lands as well as on clover in April, and on oats and beans in May. They are of great use to peas; but they render the grain harder, and more difficult to boil. In gardens they are used with much advantage, scattered over the surface, after the land is sown and raked. They are also good for hops, a handful being given to each heap. When applied to grain they promote its early growth, but are principally useful by increasing the quantity. They are in general sown by the hand, like grain; but care must be taken to leave no part of the surface without its just proportion. A still hazy morning is preferred for this operation, lest the wind should blow them away, and prevent their fixing on the soil and plants in the manner intended. The change which these ashes cause on the clover, is perceptible in the course of a week, and it is known, *from repeated experiments*, that without this precaution, vegetation has suffered so sensibly, that in some cases a crop of clover has been lost, and in others, has become less abundant. Among the other advantages of these ashes, it is said, that they not only bring with them the principles of fertility, but that they are also well calculated to hinder the multiplication of all sorts of worms and insects, (hence they may prevent the ravages of the turnip-fly or beetle,) to destroy the mosses and lichens, which injure our pasture lands, and to protect the wheat from several maladies to which it is exposed, in particular the nielle or mildew; and perhaps the exemption of Flanders in so great a degree from these maladies, is partly owing to the abundant use of those ashes.†

"When completely analysed, perhaps we may be enabled to procure an artificial compound manure, equally efficacious; or it may be found that clay ashes, now so successfully employed by Mr. Craig of Cally, Mr. Boyed of Merton-hall, and other agricul-

* The expense would now be less than when the above was written. P. P.

† It appears by the analysis of the turf, (whence the Dutch ashes are derived,) by the Abbé Marci, that the salts are found in the bituminous part of the peat: and fortunately great quantities of peat, full of bitumen, are to be found in the Hebrides.

turists in Wigtonshire, may in some respects, answer the same purposes.

"Mr. Young informs me, that whilst the crops of clover were abundant, the succeeding crops of wheat were equally good. If, therefore, by the use of these ashes, our former crops of clover can be restored, a double advantage will be obtained. The saline substances in the ashes may also contribute to destroy the wire-worm, and in that way may protect the crops of wheat from injury.

"In a celebrated experiment made in France, wheat sown after a moderate crop of clover was indifferent; after fallow was good, but after a great crop of clover that had been gypsumed, it was, in the language of the report, *superb*. The reasons are obvious. No insect can exist under so suffocating a crop as an abundant one of clover; and the roots of clover, when abundant, furnish a great quantity of manure for the wheat. It ought to be a rule in farming, to sow oats after a moderate crop of clover, but wheat after a large one.

"I do not know any means by which so great an improvement can be so rapidly, and so generally introduced, and at so moderate an expense, as by the importation of Dutch ashes: and it gives me particular pleasure, that it is likely to promote, in a peculiar degree, the interests of the spirited and intelligent farmers of the county of Norfolk, to whom this species of manure is fortunately so accessible.

"In Switzerland, and other countries where these ashes cannot be had, they make use of gypsum, or the sulphate of lime; but from the best information I have been able to obtain, there is no comparison between the two articles, the Dutch ashes being greatly superior, and much more certain, the effects of gypsum being precarious."

Art. XXIII.—*On the Construction of Roads in the Southern States; by* Joseph Eve.

"Richmond County, (Geo.) January 10, 1834.

Mr. Editor,—In travelling over the extensive piney deserts of the Southern States, the roads, from the loose sandy texture of the surface, are so exceedingly heavy,

and, from the very nature of things, and surrounding circumstances, apparently, irremediable. There are but two visible things existing around us, a continuity of sand and pine-trees, both bad materials for road-making. Not a gravel pit or a stony nole, to relieve the monotony of the scene, from which the Macadamizer may collect materials for a turnpike-road. We, therefore, jog on, patience *per force*, a defalcation of one foot, in three, by sliding back, and would almost make travellers curse the commissioners of the roads—did they not look upon it as a hopeless case, admitting of no remedy.

The reader will be startled after this description to be told, that the case is a hopeless one, only through our own fault—that we have the materials for the best road in the world, under our feet, and, generally, not separated more than the depth of a spade from the surface. The materials I allude to, are silex and argill, or in other words, common sand and clay.

It is not known, or if known, not thought of importance enough to mention, though before I have done with the subject, I expect to prove it to be of greater consequence to the Southern planters, than the discovery of Georgium Sidus, or that Venus has a moon. I mean *that clay and sand mixed in due proportions, will form a concrete substance, not easily affected by the changes of drought or moisture, or heat, or cold, except intense frost, not common in the Southern States.* The substratum of our pine-barrens is generally clay, either white or yellow, or sometimes red—red-ocre (ferruginous earth.) The upper stratum is as often sand, not a foot in thickness, which rests on a bed of clay. In making ditches in low situations, or on throwing sand and clay on dams and causeways, every body may have observed what a firm solid surface is often accidentally produced. I say accidentally, for there were no pains taken, or even an idea that mixing the sand and clay, in certain proproportions, would cause them to combine, so firmly, that a road, impervious to moisture, or the wheel of carriages would be the consequence. Hence, often, we find a dam, or a causeway firm and hard at all seasons, and under all circumstances; and the heaviest carriages, with wheels properly constructed, will make no impression on them, except to make them still harder. Our narrow wheels, indeed, would injure even a Macadamized road. On the

sides of hills, or if the road be made convex, the heaviest rains have no tendency to soften them. But, it will be said, that we occasionally meet with such portions of roads that have been accidentally made. I admit it; and I ask a question in my turn. Are not the materials of such portion of road or causeway, composed of sand and clay, by chance, in due proportions? The affinity or elective attractions between water, clay, and sand, is very great, and the retentiveness of clay, is so great, that a certain degree of water cannot be expelled from it without great heat. Sand is composed of fragments of irregular shapes and sizes, and when well mixed with clay, in such proportions, that the latter shall just fill the interstices of the sand, the surfaces of it, rest on, and support each other, and are kept united by the attraction of cohesion, as the particles of a stone are, and form an imperfect sand-stone, sometimes so hard, where it has remained undisturbed for a considerable time, as to require the pick-ax to penetrate it. I have made bricks of clay and sand, so hard, by compressing them in a brick machine, that houses might be built of them, without baking them in a kiln; and the best bricks require a considerable proportion of sand with the clay—hence, the cause of those, which come in contact with the fire, vitrifying. To explain the theory of cements made of lime and sand, will throw some light on the subject we are discussing. From not being generally understood, too much *lime*, in proportion to the sand, is used. To make the strongest mortar, the coarsest sand is the best, and requires the least lime. The theory is as follows:—quick lime, that is, lime from which the carbon (the carbonic acid gass solidified) has been expelled by heat, is a pure alkaline earth, and has so great an affinity for water, that it decomposes it, and solidifies the oxygen—and, hence, slacked-lime, though much water has been used, appears perfectly dry. If more water be added, and it is left undisturbed, it crystalizes. When quick-lime is mixed with sand and water in proper quantities, the process of crystalization commences, and by embracing and fixing themselves to the particles of sand, tie, I might almost say, rivet them together; and as the crystals are infinitely small, and of course weak, it follows, that the nearer the particles of sand are brought into contact, by having as little lime as possible interposed, so as mere-

ly to fill the interstices, but not to keep them from touching each other, the stronger will be the cement. Analogous to the above, in many particulars, is the mixture of clay and sand, that I have recommended for roads, but in this, there is no crystalization. The tenacity and adhesiveness of the clay, connects and binds together the particles of sand, as the crystalization of the lime did in the foregoing instance, and, as in that case, the sand being the stronger substance, it follows, that too large a proportion of clay must be avoided. If we had in all cases to experiment with pure clay and pure sand, or clay and sand of the same quality, a very few trials would be sufficient to ascertain the proportions that would possess the greatest adhesiveness, and that would make the best road. But the fact is, that though we sometimes meet with sand and clay tolerably pure, we much oftener find them combined with each other, in various proportions; indeed, very often, in the proper proportions, to make the best road; and, from this circumstance, we often find, that the throwing of dirt on the road in making ditches on each side, we make a good highway, sometimes equal to a turnpike, without intending it—hence, also, the sand thrown out of a well, in making it, will cause the yard for a considerable distance round to be firm and hard for ever after.

Agreeably to observations I have long made, we shall never be disappointed in finding the materials we want for our road, either within a foot, or a few feet of the surface, or laterally, in a valley, or on a ridge, at no great distance. The materials will cost nothing, and very little labour, in comparison with the value of the object, in bringing them together.

I do not know that I am bound or called upon to give the details of the process of making the road, but I feel so interested in the success of it, that I will, at least, slightly engage in the enterprize. I would proceed, in this manner. Where there had never been a road previously made, (for if the object were to improve a road, only one half should be undertaken at a time) I would make segments of boards, whose length should be equal to the width of the road, and of the proper convexity for the transverse section of the road. Many of the segments should be made and placed in a line across the direction of the road,

at proper intervals. Any body could do this, but what is to follow is not quite so easy, and will require a man of judgment and good sense. The mixing of sand and clay in due proportions, is, perhaps, more than man could do, from materials, so various, and, in scarcely two instances alike, we can only hope for an approximation to it, and it is sufficient for our purpose. But whether we hit the mark or miss the target altogether, it is indispensable, that for certain distances there should be no variation, the necessity of which will appear obvious from what follows. When the road is submitted to trial, if the weather be wet, the portion of it in which the clay predominates, will become soft and slippery. On the other hand, if there be an excess of sand and dry weather succeed, the surface will lose its tenacity and become arid and sandy. These indications are all that are required to enable us to apply the remedy. In the first instance, spread a stratum of sand of a *uniform thicknesss*—hit or miss, you will near the mark something. In the latter indication, (when dry weather makes the road sandy) apply clay in the same manner, and in either case, plough and harrow the road well, and always throw the furrows towards the centre of the road. As no mathematical exactness is required, you will seldom find it necessary to repeat this process, if a tolerable degree of judgment has been exercised in performing the work in the first instance.

One superiority the clay and sand roads will have over the Macadamized, is of no small moment, it will be made the better by using, and never wear out, and will require little or no repairs, after the experiments are made, that in some instances, may be necessary, in compounding the materials in due proportions; the parts detached by the wheels of carriages, or by horses' hoofs, if ever any should be, would be reunited again, and no loss of substance would ever be sustained, except on the declivities of hills, or where the roads were made too convex, in such places, heavy rains might wash the clay from the sand. To prevent this, the roads should be made with no more convexity than would prevent the middle from settling into a hollow when it becomes consolidated; and on declivities an excess of clay should be used in the composition. I have seen hills naturally, where there was such a lucky hit, in their component materials, that neither wet or dry deteriorated;

and every one has seen parts of level roads, as I have before observed, that from the same circumstance, required no reparation. The Savannah road, opposite my residence, for about two miles and a half, between Butler and Rockey creeks, is an instance, where the composition of the soil is naturally the *lucky hit*, I spoke of above. This portion of the road, is always good, though much used by wagons, very heavily laden with produce of the country, merchandize, and fire-wood. There are no ruts, though, in many places, the water remains on it in rainy weather. For the next three miles, towards Augusta, there is an excess of clay, in the composition of the soil, and hence, in rainy weather, the road is very sloppy, and would be a very bad road, if much pains were not taken by the Commissioners of the Roads, to keep it in order. Between Butler and Spirit creek, about six miles, sand predominates, therefore, in dry weather, the road is very heavy, but still much less so, than between Spirit creek and M'Been's, where the sand is unmixed with clay. But in all these instances, clay or sand judiciously applied, as the case indicated, would make the whole of this portion of the Savannah road equal to a turnpike.

I mention the above, as familiar examples, just at my door. Other roads, and portions of roads, are all comprised in the varieties above stated. Namely, where the soil is naturally of the proper materials for a road (the most uncommon,) where the clay is in excess, or where the sand predominates. And the remedy, in each case, would be, as I have suggested above.

But I must now, as connected with the subjected, say something of the wheels of wagons and carriages, that would be most proper for such roads. To give you some idea of mine relative to it, I will say, in a word, that they must be just the reverse of those in common use. I mean that, whereas, these are as narrow as possible, they ought to be as wide as possible, to be convenient, I mean, of course, on the periphery. Our wagon wheels would ruin the best Macadamized road in England. Sixty years ago the wheels of carts for hauling wood, &c. in Philadelphia, were, at least, six or seven inches wide, on the outter surface of the periphery, with the double tire, in segments. Their load was a cord of hickory or oak, weighing about three tons. In New-York, at the same time,

wood and every thing was hauled on what they called cars, a kind of one-horse cart, with wheels on their bearing surface, about five inches. They were not suffered to be tired—the load was a quarter or a half cord of wood, I do not recollect which, but I am inclined to think, the former. With such wheels, the road, I propose, would improve, instead of being deteriorated by constant use.

The expense of constructing roads of clay and sand in a level country, would be, comparatively, trifling, as there would be no out-lay for materials, and the labour would be of the least costly kind, chiefly of slaves, or of that class of our own colour, denominated labourers, in contradistinction to artizans, with competent overseers to direct the work. I will, in fact, venture to say, that the making of such a road would cost less than the simple interest of the capital invested, and the current expenses of a rail-road for a single year; and that afterwards, it will be attended with an inconsiderable expense to keep it in repair, as I have before stated, and I would add, but that "comparisons are odious," according to this odious adage—that more general benefit would accrue from it, to the section of the country through which it might pass, than would be derived from the best single or double track-way rail-road that will ever be made in the Southern States; and, though I would not compromit my opinions of rail-roads, as a means of internal improvement, in a thinly populated country, yet, on the other hand, I would not gratuitously obtrude them when at variance with the general sentiment regarding projects irremediably engaged in, that are struggling with the weakness and inexperience of adolesance with difficulties requiring the mature strength of manhood to contend with.

As there are companies now forming in Great-Britain for establishing lines of stages on the locomotive principle, and for the traction of merchandize on common roads, it is probable, that they have arrived at the state of perfection, that has been long anticipated. I am confident that not even a Macadamized road would answer for them, better than the road I have been describing. We see, by late accounts from England, that locomotive carriages are capable of running, even on sandy roads, and up hills, whose acclivity is one foot in nine, with great speed. Our clay and sand roads would not be injured, but improved

by their wheels acting as rollers, which would consolidate them.

If I were called upon to designate situations were such roads might be located to general advantage, and with few difficulties. I would name, generally, the tract of country, in the Southern States, between the head of navigation on our rivers and the sea-board; and particularly, I would point out the space between Charleston and Savannah, and thence to Darien and St. Marys; and from Savannah to Augusta. From Georgetown to Charleston, is, equally eligible, but I only particularize such situations as I am best acquainted with.

If roads should ever be made on the plan I have recommended, there is one error that I foresee, will, very probably, be fallen into, that will have a tendency to defeat, or delay the success of the undertaking. It is this—that from the apparent simplicity and facilities that present themselves, the difficulties, though comparatively few, will be apt to be underrated, and inadequate means resorted to. Much labour will be required in executing the work, and much tact and judgment in these matters will be called into requisition, to direct it, and they must be paid for, or they will not be obtained.

Experiments might be made for short distances, to ascertain the feasibility, and to demonstrate the correctness of the principles of the plan; and, which would, also, afford data, by which calculations might be made, which would give us a tolerably correct idea of the expense on a large scale.

I am, respectfully, Sir, your obedient servant,

JOSEPH EVE.

PART II.

SELECTIONS.

ART. XXIV—*An Address before the Hampshire, Franklin, and Hampden Agricultural Society, delivered in Greenfield, (Mass.) Oct.* 23, 1833; *by* HENRY COLMAN.

(Concluded from page 146.)

The use of mineral manures, such as lime and gypsum, ought to claim much more attention than it has done. The theory of their operation is still among the numberless secrets of nature, into which human sagacity attempts in vain to penetrate, and before which man's boasted wisdom stands utterly confounded; but their practical, beneficial, and astonishing results are no longer matter of question. Lime, in any quantity in which we might be glad to apply it, is too expensive a manure to be freely used among us; but no manure can be cheaper than gypsum; and its effects are very extraordinary. Its mode of application is still however matter of experiment; and experiments here are greatly desired. On our alluvial lands its effects are said not to be apparent; on our hills, in some cases most strikingly so. An intelligent farmer on the Hoosac river informed me that they had found the use of it on lands, where the growth was maple, beach, &c. of no avail; but on their pine and oak lands separated from the other only by the river, immediate and valuable. To clover it is applied always with great advantage. Every well-attested fact in regard to it deserves attention, and ought to be fully and exactly communicated to the agricultural public.

Another means of improving lands, the value of which experiment has amply confirmed is the intermixture of soils. What is properly called marl, an unctuous and calcareous clay, which will effervesce on the application of acids, has not been found among us. A valuable deposit of it has been recently discovered in New-Jersey, which the farmers are there applying with great advantage. In our primitive region it is perhaps not to be looked for. But we have peat, bog mud, sand, and clay in abundance in different parts of the country: and the application of clay to a

sandy, and of sand to a clayey soil, is of obvious utility; and often of better and certainly more permanent effects than the most abundant dressing of animal manures. Some of our Deerfield farmers, I am told, have found the application of clay to a certain extent as a top dressing on their grass grounds of great advantage; but I am not sufficiently advised on the subject to speak more fully. An intelligent farmer of Plymouth county,* whose authority, I know from personal acquaintance, is to be entirely relied on, has practised with great success and to a considerable extent on this principle of the intermixture of soils; and has rendered his farm, at first quite inferior, one of the most productive in the county. He has given the details of his experience to the public in a dissertation, for which he was honored with the premium of the Massachusetts Agricultural Society; a dissertation deserving the attention of every inquisitive farmer.

The next means of improving your lands is to extend your cultivation. The more produce to be consumed, the more manure to be applied; and so the enriching and improvement of your land may be kept on in a continually accelerated ratio. I am aware that the proposition to extend your cultivation, with a view to the improvement of your farms, will be received with distrust; this will excuse me for dwelling upon it more at large. I will give you my opinion; and shall be happy to be corrected by your better judgment.

I admit that in general it is a good rule in husbandry to culivate no more land than you can manure well; and to manure well and tend well all you do cultivate. I would recommend it strongly as any one; but under peculiar circumstances there are excepted cases to every rule however reasonable. Your farm is run down and impoverished. You wish to restore it; to wake its dormant energies; and, if possible, to make it stand upright again. Agricultural improvements are always slow. It requires a year to accomplish the most simple experiment; and often many years to effect any extraordinary alteration. But there must be a beginning, and the first step in any valuable undertaking is commonly difficult and discouraging. When Ledyard, a lad, animated by the indomitable spirit of adventure, first launched his frail canoe, more than a hundred miles from this spot on the waters of the Connecticut, to him an unexplored stream, it required a bold heart to push from the shore into the descending current; but as he was bourne along his winding and fertile banks, he was cheered by the consciousness of his onward progress and triumphant adventure; and continually more and more animated by the hope of farther knowledge, success, and power. This confidence of progress, this hope of ultimate success, certain to persevering and judicious labour, is the great encouragement, which is to sustain us.

* The Rev. Morrill Allen, of Pembroke, Mass.

Let us suppose, then, that you have an impoverished acre of land, and at present no manure to apply to it. What is to be done? Perhaps it will bear rye, the crop which seems to demand less of the soil than any other; and will put up with the meanest fare. At present it gives you comparatively nothing. Sow it then with rye and clover, plaster it; gather your rye; perhaps you will not get back even your seed. Now use the straw carefully for litter, and convert it either by means of your swine or cattle into manure;—plough in your clover, if there is any of it, after it has gone to seed: apply the manure be it more or less, which you obtained from the straw gathered from this acre, and be careful not to cheat the land of any thing that belongs to it. Sow it again with rye and clover and repeat the same process. The second crop may be expected to be better than the first; and, though the returns may for sometime be small, they will be continually increasing, and will soon be a full return for the labour and expense applied. Your land will be in the course of improvement, and your means of enriching your soil will be increasing in a correspondent proportion. If in addition to this you can, as I before remarked, depasture such clover with sheep; and enrich such land by the addition of some soil in the neighbourhood suited to its improvement, the balance of such husbandry will be in the end greatly to your advantage. This is one process, which may be adopted without any great outlay to the improvement of worn out lands, where manure is not to be obtained; but there are other modes, and other crops by which it may be effected, which the time does not allow me to particularize.

There is another ground on which farmers, whose whole profession and business is husbandry, and who are looking to its fair returns as an honest compensation for their labour, should be urged to extend their cultivation. If any portion of your land is absolutely worthless; and you are satisfied that by no process, which you can apply it, you can ever obtain an equivalent for the labour employed in its cultivation, then indeed for cultivation let it be abandoned, or appropriated to any purpose in which it may yield something, and the most that it can be made to yield.

There is likewise land, which is in permanent meadow; and which by no cultivation can be made so productive as in it present condition. Leave this then as it is. It would be very injudicious to disturb it. But on many farms there is some land, which is turned into pasture and affords but a scanty supply to the animals, which are fed upon it; or which remains in mowing, yielding a small crop of hay, which by cultivation might be made to yield good crops of corn, potatoes, and grain; and then be rendered far more productive of grass than in its present state. I believe there is much land in this condition, and this induces the complaint that our farms are too large for a profitable cultivation. Why should such land remain uncultivated? Why should you be

satisfied with less than half a crop? What would you say of the capitalist, who was bent upon increasing his fortune, who permitted any portion of his capital, which he could use without loss, to remain in his coffers unemployed? What should we say of the manufacturer, who should suffer any portion of his power to run to waste, or of his machinery to be unemployed, or of his raw material to lay by in useless accumulation, when it might all be employed to more or less advantage? He might by such a process consult his ease, but certainly not the advancement of his fortune. We can say nothing different of the farmer, who permits any portion of his grounds to remain unemployed; or who neglects to obtain from them all that they can be made to produce. We believe that there is little land of a kind which may be cultivated without loss, but what may, by judicious and persevering labour, by a process within the power of the farmer, whose means are restricted and humble, be placed in a course of certain improvement, and afford a fair profit to his exertions.

The answer commonly given to these suggestions is, that labour is so expensive we cannot afford to cultivate our land. I admit that the expense of labour is very high compared with the value of produce. Yet I cannot but believe, in circumstances ordinarily favourable, and where the price of land is not exorbitant, the man, who attempts to thrive by the plough, and does himself either "hold or drive," if his management is judicious and persevering, and his habits frugal and temperate, will obtain a fair compensation for his labour and pains. If then the balance of his cultivation is upon the whole in his favour, why should he not extend it as far as it can be extended to advantage? Why should he permit a single acre of his land to remain unproductive, which may be made productive? If he can plant ten acres to advantage, why not plant twenty? If he can produce two hundred bushels of corn, why should he not attempt to raise five hundred? In short why should he not carry his cultivation to the utmost limits of a profitable return? Beyond that certainly we would not advise him to go. Under such circumstances he engages in no dishonourable competition; his gains are at no other man's expense or loss; on the contrary he contibutes essentially to the general good, as the increase of his produce tends to a certain proportion to lessen his price in the market; and renders therefore the comforts and supplies of life more accessible to the poorer classes of the community, and certainly not less so to the richer.

This brings us to the great subject of the proper size of farms. It is often said that an acre of land well manured and cultivated is better than two acres poorly or imperfectly manured and cultivated; but it is not so good as two acres well manured and cultivated; nor is it so good as two acres poorly manured and cultivated, if the profit from the two acres is, after all expenses are allowed,

greater than the gain from the one acre, though not in an equal proportion. He is the best farmer, as far as agriculture is considered in a pecuniary view, whether he cultivate much or little, who obtains the greatest amount of produce at the least expense.

A farm is two large, when from its size any part of it is necessarily left unproductive and uncultivated; or if from its extent its owner or landlord is incapable of its careful superintendence. But a farm is not too large, when its perfect and exact superintendence, is practicable to its owner; when every part of it is made as productive as the nature of the case admits; when upon the whole result it yields a fair remuneration; and no part of it can be withdrawn from cultivation without a diminution of its profits. Farms are often too large; too large for the capital, which the owner is able to apply to the management, for a successful agriculture can no more be prosecuted than a successful manufacture of any kind can be prosecuted without a considerable floating capital; and they are often too large for the superintendence of a single individual, for the management can seldom be divided or any part of it neglected without loss or injury; but it is to be remembered that large farms are always cultivated at a much less proportional expense than small ones. The expenses of outfit in regard to utensils, team and its appendages, and a great variety of necessaries, is by no means double on a farm of large size to what it would be on a farm of half the extent. Many advantages are found on a large farm from the division of labour, which is practicable among a number of hands, and from the convenience of having a number of labourers at command, when any pressing emergency occur; and from the opportunity of constant use of all the brute labour to advantage on a large farm, which is not possible on a small farm; though it may be that the same amount of team must be supported. The larger the farm, if well managed, the greater the profit; and in the kind of farming of which we are treating, the amount of profit obtained, after the amount of debit and credit is fairly adjusted, must be the test of its excellence.

Another means of success, to which the attention of the farmer must be particularly directed, is that of the saving of labour. Though he should be averse from beholding labour, wherever it can be profitably applied, yet it should be a great study with him how to apply it to the most advantage. His profession under the best circumstances will require much hard toil; and he cannot look to avail himself of those facilities and aid, which the machanic and the manufacturer find in the invention of the most curious machinery, and the application of water and steam power to their various arts. Yet the farmer is not without advantage from the improvements of science and mechanical ingenuity. An immense gain has been effected in the great machine, the plough; and in regard to the facility of holding, the ease of draught, and the man-

ner of executing the work, the modern cast iron plough of the most improved construction has an extraordinary advantage over the clumsy and cumbrous machine of former times. The revolving horse-rake is a machine of great utility; by which on smooth land a man and boy and horse will easily perform the work of six men. A threshing machine, whose operation has been completely tested, has lately been introduced here, which promises to be of great utility. It is worked by a single horse, and without difficulty transported from place to place. It performs its work in a perfect manner and has been known to thresh two bushels of grain in five minutes. Two men, a boy, and a horse, will easily thresh one hundred bushels a day; and the actual saving of grain, from the more effectual manner in which it performs its work over what can be done by a flail, is very great. A roller of an improved construction is exhibited on this occasion; and deserves the attention of farmers as an instrument next in value to a harrow or a plough, and almost as indispensable to good cultivation. This is literally the age of invention. Improved machines for shelling corn, for cuttiug fodder, for grinding corn in the cob, &c. are fast coming into use, and promise great advantages. We may hope that other inventions may present themselves to ingenious and inquisite minds, by which the severe toil of the husbandman may be lightened and abridged.*

Another great object of the farmer should be to restrict the expenses of his farming establishment; to cut off all unnecessary expenditures; and to apply his produce, as far as it is consumed on the farm, in the most frugal manner. The cooking of much of the food of his domestic animals increases its nutritive powers; and causes it to spend to much more advantage. The cutting of fodder for his horses and neat cattle is of great utility, and will effect a saving, as the most exact experiments have shown, of more than one quarter. The preference of ox labour over horse labour deserves his particular attention. The keeping of a horse is a great expense separate from the accidents to which he is exposed; and in most respects the patient ox has greatly the advantage over him, especially as the former is an improving and the latter always a deteriorating capital.

The crops to which the farmer may to most advantage devote his cultivation will deserve his particular consideration. Indian

* A mowing machine moved by horse power, and producing a great saving of manual labour, has been for two or three years in successful operation in Pennsylvania, and in the western parts of New-York: and from the testimony of one of the largest farmers in the United States, upon whose farm it has been two years in use, is highly successful. We cannot imagine what human skill and enterprize may yet effect. Professor Rafinesque, of Philadelphia, a gentleman of distinguished scientific attainments, advertises, for farmers, his "steam ploughs, by which six furrows are ploughed at once; and he promises in one day to perform the work of a week in the best manner." Of their construction or operation I have no idea.

corn, of which I have not a doubt the crops in this part of the country may be easily doubled, is a most valuable product. I congratulate the farmers upon the favourable prospects, which now present themselves in regard to the cultivation of wheat. The two last years have presented extraordinary encouragements, and by proper management, and especially by early sowing, success in this cultivation becomes highly probable.

The establishment of extensive manufactories, and the introduction of power-looms and spinning-jennies has nearly destroyed the usual household manufactures, and put our other jennies out of employment. Our ears are seldom greeted now a days in the farmer's cottage with the flying of the shuttle, or the deep base of the spinning wheel. We confess that we have looked upon their departure with a strong feeling of regret; and deem it no small abatement of the advantages, which the establishment of extensive manufactures has obviously yielded to the country, that it removes the daughter from the shelter and security of the paternal roof, and places her in a situation, which certainly furnishes no means of qualifying her for the proper department of woman; to preside over our domestic establishments; to perform her part in the joint labours of the household; and to know how and when and where to use, prepare, and to apply to the best advantage within doors, the product of man's labour without doors. Many occupations of female industry, strictly domestic however, of a healthy and agreeable nature, are constantly presenting themselves, so that there is little danger that the race of industrious women, and accomplished wives, at least among the country gils, will sooon be extinct; and the silk culture, fast gaining ground among us, promises to furnish an unexhausted resource and a profitable employment of female labour.

IV. A variety of important topics press themselves on this occasion upon our attention; but I forbear, having already trespassed too far upon the candor of my respected audience.

Agriculture is a great subject. The first of all the arts, it may derive aid from them all. The foundation of human subsistence, comfort, and enjoyment, the origin of all wealth, and the basis of commerce and manufactures, it deserves the profound attention of enlightened and philanthropic minds. That attention it has often and will continue to receive. Agriculture is already greatly in debt to science. Ignorance and prejudice may deny the obligations; but all the great improvements, which have ever been made in agriculture, have been effected by the inquiries and experiment of men of enlightened and active minds, of wealth and public spirit. Their experiments have been made often at a serious expense to themselves, but at a proportionate gain to others. They have often been wholly unsuccessful; but in an art so entirely practical as agriculture, it is as important to know what cannot, as to determine what can be done. There is no prejudice more con-

temptible and senseless than that which prevails against what is called book farming, and professes to disdain all instruction, which comes in a printed form. If by book farming be meant that a man undertakes to cultivate his farm by mere theory without any experimental knowledge or observation, I only say that no such instances have come within my knowledge; but if it be meant only that an intelligent man avails himself of the history of the agriculture of other men and other countries, as far as it is applicable to his own condition, and of all the aids which science or art, chemistry, botany, zoology, anatomy, entomolgy, natural history, natural philosophy and mechanics can afford in relation to the subject; and of the actual and exact experiments of other men faithfully made and fully detailed, I am not able to see how he could pursue a wiser course, for his own interest and success, the general improvement of the art, and the benefit of society.

It is to be hoped that the intellectual improvement of the agricultural classes will keep pace with that of other classes in our favoured community. In that impetuous struggle for advancement in knowledge, which is every where hurrying the working classes forward, may the farmers neither hold back, nor get out of the traces, nor lag behind. Their opportunities for improvement are great. Books are universally accessible. Small associations or circles for mutual improvement are highly useful as well as agreeable; and the long evenings of winter, instead of being worse than wasted in the senseless gossip and idle talk of the shop or tavern, afford most favourable opportunities for useful reading, for the instruction of our families; and the enjoyment of the innocent and delightful recreations of domestic life.

The respectable farmer occupies a most important and responsible moral station in the community. Coming in contact with a numerous class of young men, whose manners and morals have been too often coarse, vulgar, intemperate, and disreputable, it becomes his duty, and he should deem it a great privilege to exhibit such an example of sobriety, decorum, civil manners, and blameless conversation, as can hardly fail to command their respect and to win their esteem. Profaneness, indecency, and intemperance, which have been but the too common vices of this class of men, he should resolutely expel from his territory; and above all things not countenance them by a disgraceful example. The farming interest is fast experiencing the most important benefits of the utter disuse of ardent spirit, the complete exorcism of this worst of evil spirits from their premises. Many a thrifty farm and many a beautiful cottage, the abode of industry, contentment, and competence, has been washed away by the bitter stream of New-England rum; and it has gradually undermined the tenement, until at last the whole inmates have fallen in a common ruin, and have floated downwards on a current which never stops, into the dark ocean of infamy and unutterable wretchedness.

Agriculture can never be looked to in this part of the country as a source of wealth. Yet it may be made to yield an ample competence; and sufficient to satisfy the reasonable desires of a well disciplined mind, which has just views of human life, and is neither cankered by vice nor intoxicated by ambition. His gains, the fruits of honest industry, made at no man's expense, and prejudicing no man's interest, may be enjoyed with the full satisfaction of his own heart and conscience. His occupation presents no hazards to his own or his children's virtue. He has at his command all the means of subsistence and comfort. His abode is the calm abode of peace, industry, frugality, and contentment. His table is spread with the substantial fruits of his own labour. His clothing is gathered from the flocks which he himself feeds; and woven by the industrious hands of the wife and children whom he loves, and who loves to share his labour, he wears it with honourable and enviable pride. When honour and integrity, kindness and piety shed their combined influence over such a habitation, however, lowly, humble, secluded, weather-beaten or moss-covered, it presents an example of substantial independence and domestic comfort, which the proudest monarchs of the earth may envy.

The farmer of all others should be a man of religion. If pious gratitude and confidence find no place in his bosom, his mind must be debased by selfishness, and his heart as hard as the stones of his fields. "Even the ox knoweth his owner and the ass his master's crib." How can he then, receiving so immediately as he does from the hand of God the exuberant bounties of his providence, be unmindful of the source of all his power and all his blessings.

In the wonderful operations of nature constantly going on, around him, he is compelled to remark the wise and ever active providence which sustains and directs all things. In the part which he is called to perform in these extraordinary and miraculous processes, he is most forcibly reminded of his own dependance. In the abuudant fruits which crown his labours, and the ample and rich provision every where made for the support and enjoyment of all the animated creation, he cannot but adore the infinite goodness of the AUTHOR and Mysterious PRESERVER of nature. In every department of the wide field in which GOD requires or permits him to toil or to partake; as the humble co-operator in the labours of the great HUSBANDMAN or the favoured recipient of his unrestricted bounty; he has constant occasion to regard Him as the great object of his reverence confidence, and love; of his humble and devoted obedience; of his fervent and filial gratitude; and to bow down before Him as "all in all."

Art. XXV.—*Culture of Sugar-Cane in Louisiana.*

[From the Manual on the Cultivation of the Sugar-Cane, and the Fabrication and Refinement of Sugar. Prepared under the direction of the Hon. Secretary of the Treasury, in compliance with a Resolution of the House of Representatives of January 25th, 1830.]

(Continued from page 154.)

Chemical History of Cane Juice.—When the cane has arrived at maturity, its juice contains, besides the water of solution, sugar, gum, vegetable mucilage, albumen, gluten, green fecula, (or green colouring matter,) and lignin; to which may be added several free acids and salts, which, however, exist only in minute proportions, without exercising any appreciable influence over the process of obtaining the sugar in a separate state. The properties of these ingredients require a separate elucidation: this we shall attempt, in the first place, under the idea of their existence in an insulated condition, or in a state of purity, and afterwards as they present themselves united in the cane liquor.

1. *Sugar.*—This substance when in loaf, consists of an aggregate of little chrystaline grains, is white, inodorous and of a well known sweet taste.

It is hard, brittle, and emits a phosphorescent light, when two pieces are rubbed together in the dark. Its specific gravity is 1.6065.

When a saturated solution of it, in water, is left to spontaneous evaporation, in a warm place, it crystalizes in very perfect oblique rhombic prisms, whose acute lateral edges are often truncated, and whose summits are terminated by two or more planes. These crystals are transparent; and although heated to the point of fusion, they lose no weight.

Stove-dried loaf sugar is also anhydrous or destitute of water; and appears to be unalterable in the air. It becomes fluid at a heat somewhat below 300° of F.: when the heat is raised above 302° of F., decomposition commences, attended with a peculiar odor, called by the Freach, *caramel.* At a temperature, a little below ignition, it bursts into a flame, affording the usual products of the destructive distillation of vegetable matter.

Sugar is soluble in water in nearly all proportions. When dissolved in one third of its weight of that fluid, it forms a syrup which keeps well in close vessels; but if more highly diluted with water, it rapidly changes, particularly if in contact with air,—becoming sour and mouldy. The addition of certain vegetable or vegeto-animal substances, such as albumen and gluten, or of yeast, produces a reaction among its constituent elements, which gives rise to the vinous fermentation,—a process in which the Sugar is converted into carbonic acid and alcohol, the former of which is disengaged with effervescence, while the latter remains in a great measure, in the liquid.

Sugar is soluble in about four times its weight of boiling alcohol of the specific purity 0.83, which, on cooling, deposits the greater part of the Sugar; but it is probably insoluble in absolute or pure alcohol.

It is altered by the action of the acids. Concentrated sulphuric acid, poured upon it, becomes blackened, and on being diluted with water, a carbonaceous precipitate ensues. The effect of nitric acid on Sugar, is to transform it into malic and oxalic acid. Oxalic or tartaric acid, added in the proportion of three per cent. to Sugar, destroys its power of chrystalization, nor is it restored when these acids are saturated by carbonate of lime or carbonate of lead.

Sugar enters into chemical combination with the salifiable bases. Dissolved in a ley of potash, it loses its sweet taste and gives, after evaporation, a mass which is insoluble in alcohol; but on the addition of the requisite quantity of some acid to engage the alkali, the Sugar re-appears in the solution, possessed of its original properties. When introduced, in the condition of a fine powder, into a bell glass of ammonical gas, over a mercurial bath, the gas is gradually absorbed, while the Sugar becomes compact and soft, to such a degree as to allow of being sliced with a knife. It emits the odor of ammonia. Analysis proves it to consist of 90.28 parts of Sugar, 4.72 of ammonia and 5000 of water. In the air, this compound undergoes a spontaneous decomposition.

Dissolved in water, Sugar combines with the hydrates of the alkaline earths, forming with them an uncrystallizable mass of a slightly surgary odor, and a bitter astringent taste. When a solution of such a compound is evaporated, it becomes viscid and at length hardens into a yellow, gummy mass,—exhibiting, when broken, a conchoidal fracture.

According to the experiments of Daniel, Sugar dissolves about one half its weight of lime. Having boiled together, for half an hour, 1,000 parts of Sugar, 600 of quicklime and 1,500 of water, and examined the liquor, after its cooling, he found that it contained in 100 parts, 16.5 of lime and 33.2 of Sugar, and that in evaporating it slowly, it assumed a solid consistence with the aspect of gum, in which, when the compound was freshly decomposed, the Sugar manifested its original properties; but, on being left for several months in a moist condition, the lime separated itself in the state of carbonate of lime, crystalized in very acute rhomboids, while the Sugar was transformed into a mucilaginous gum.

Sugar, according to Berzelius, forms with oxide of lead two combinations, of which one is soluble, the other insoluble. By digesting a solution of Sugar with a certain quantity of oxide of lead, a liquid solution is obtained, which has the re-action of alkalis and leaves, after evaporation, an uncrystalized, viscid mass, which attracts moisture from the atmosphere. When a solution of

Sugar, boiled with an excess of oxide of lead is filtered and corked up from the air in a phial, it deposits after 24 hours standing, a voluminous, white precipitate, which on being separated and dried, is destitute of taste, and insoluble in cold and boiling water. Its drying requires to be effected in *vacuo*, in order to avoid decomposition. It burns like tinder, when a mass of it is lighted at one extremity,—leaving behind numerous little globules of metallic lead. It is soluble in the acids, and likewise in the neutral acetate of lead, which forms with the oxide of lead a sub salt, and sets the Sugar at liberty. Its powder, mechanically suspended in water, is decomposed by a current of carbonic acid gas, passed through that liquid,—the Sugar making its appearance in the solution, while the carbonate of lead falls to the bottom. This compound of Sugar and oxide of lead is insoluble in alcohol. By analysis, it affords 58.26 oxide of lead 41.74 Sugar.

Sugar does not combine with any salt, although it decomposes several metallic salts. It has the remarkable property of dissolving the carbonate and the sub-acetate of copper, and of thus giving rise to a green liquid, from which the oxide of copper is not precipitated by alkalis, but by ferro-cyanuret of potash and by sulphuretted hydrogen. Dr. Ure is of opinion that no re-agent is capable of precipitating the copper from the solution of sub-acetate of copper in Sugar. Sugar, boiled with solutions of the salts of copper is known to act upon them by effecting their reduction. When the sulphate of copper is thus treated, metallic copper is precipitated, a part of the cuperous salt remains in solution, and there is thrown down with the metal a brown substance soluble in ammonia. The nitrate of copper submitted to the same treatment, gives no precipitate, but it is transformed into a cupreous salt, and potash forms in the solution, a yellow precipitate of hydrate of copper. Sugar, boiled with the acetate of copper, occasions a copious precipitation of the oxide of copper.

By the aid of ebullition, Sngar, added to a solution of nitrate of silver, affords a pulverulent, black precipitate whose composition is unknown.

The chloride of gold gives a pulverulent, red precipitate. When Sugar is added to a solution of salt of iron, the oxide of iron is not wholly precipitated by ammonia.

The analysis of perfectly anhydrous Sugar has been made only by Berzelius. In burning the compound of Sugar and oxide of lead, he obtained from 100 parts of Sugar 57.5 to 57.75 parts of water, and 16.25 to 16.3 of carbonic acid, which leads to the following conclusion as to the composition of Sugar:

Carbon, - - - -	44.99
Hydrogen, - - - -	6.41
Oxygen, - - - -	48.60

Common Sugar, or Sugar not perfectly anhydrous, has also been subjected to analysis by Berzelius, as well as by other chemists, the results of whose labours are as follows:

	Prout.	*Gay, Lussac & Thénard.*	*Berzelius.*
Carbon,	42.35	42.47	42.225
Hydrogen	6.44	6.90	6.600
Oxygen	50.71	50.63	51.175

2. *Gum.* This is a transparent, colourless substance. It is uncrystalizable, occurring in the form of small globular masses. The fracture is conchoidal, with a vitreous lustre, and a specific gravity of between 1.31 and 1.48. It is destitue of lustre or odor.

It contains no water; but when an aqueous solution of it is gradually evaporated, the gum retains, even when perfectly dry, about 17 per cent. of water, which it gives up on exposure to a heat of 100° *in vacuo.*

It is slowly, but completely dissolved in water in every proportion and more readily in warm than in cold water.

The solution is mucilaginous, tasteless and inodorous: its viscidity presenting very minutely divided matter suspended in it, from being deposited. If, for example, a metallic salt, as acetate of lead, be added to a solution of gum, and current of sulphuretted hydrogen be passed through the resulting fluid, the sulphur will not be precipitated but will remain mechanically suspended in the solution.

For the same reason, gum hinders Sugar and the soluble salts from crystalizing.

Left to itself, a solution of gum gradually becomes acid,—exhaling an odor like acetic acid.

Gum is soluble in alcohol and in ether.

Alcohol precipitates it, although imperfectly, from its solution,—the precipitated liquid remaining, for a long time, milky.

Gum is equally soluble in acids or in water,—the concentrated acids altering its composition. Strong sulphuric acid decomposes it,—causing the formation of water and acetic acid, with a deposition of charcoal. Nitric acid, aided by a mild heat, occasions the evolution of nitric oxide gas, and on cooling, the liquor deposits mucic acid in the proportion of from 0.14 to 0.25 times its weight of the gum. By a protracted digestion, malic and oxalic acids are obtained.

Gum forms definite compounds, with salifiable bases. If a concentrated solution of Gum be mingled with a solution of potash, a coagulated precipitate makes its appearance,—consisting of gum and alkali, which afterwards dissolves. When alcohol is added to the solution of this compound, which contains an excess of

alkali, the combination of gum and alkali is precipitated, while the excess of the potash remains in solution. The precipitate is of a curdy nature, which when dried is easily reduced to powder, and may be again dissolved in water.

Gum unites with the oxide of lead, when a solution of the former is digested with the latter, and the union is promoted by levigation. The compound is insoluble. It may be obtained also by mingling a solution of gum with the sub-acetate, or sub nitrate of lead. The mass is curdy. After washing and drying, it is white, and easily reduced to powder. It consists of 61.75 gum and 38.25 oxide of lead. Exposed to the action of heat, gum is decomposed, giving rise to the same products and phenomena as other vegetable matter: i. e. to acid water, empyreumatic oil, carbonic acid gas, carburretted hydrogen gas and a spongy charcoal. When heated, it yields also a small quantity of ammonia, which is believed to be owing to some impurity, probably gluten, with which it is generally associated. The following are the results obtained from the analyses of gum arabic, 1 by Gay Lussac and Thenard and 2 by Berzelius:

	1.	2.
Hydrogen, - -	6.93	6.374
Carbon, - -	42.23	42.682
Oxygen, - -	50.84	50.944

3. *Vegetable mucilage.* This proximate principle of plants presents itself under the form of a jelly, more or less translucent, which, when diluted with a large quantity of water and thoroughly blended with it, becomes so attenuated, as to pass through paper like a viscid liquid, every drop drawing after it a thread, whose upper portion, when it breaks, rises to the paper. In this condition, the mucilage appears to approach to the state of a solution: but on employing a smaller quantity of water, it is seen to be only a mere swelling of the mucilage which takes place, as appears from the fact that the mass, on being thrown upon blotting paper, communicates to it none of its mucilaginous properties.

After drying, the mucilage forms a hard mass, translucent, white, or yellowish, without taste or odor, and which swells up, and becomes a second time buoyant on water.

Like gum, it affords the smell of ammonia by distillation, but it is not known whether it contains nitrogen, or whether this element comes from some foreign matter with which it may be associated.

The alkalies and acids dissolve, and destroy its mucocity, converting it into a matter analogous to gum. When subjected to a boiling temperature in a large quantity of water, the same change is said to take place.

It is not improbable that mucilage is only a modification of gum, or possibly an incipient gum.

4. *Gluten* is possessed of the following properties: when dry, it is of a pale yellow colour, translucent, hard and brittle; when moist, it adheres tenaciously to the fingers, and has considerable elasticity. It is without smell or taste.

It is ordinarily slightly acid, owing to the acids with which it is combined, as the acetic and phosphoric.

It is insoluble in water and ether, but dissolves readily in hot alcohol, apparently without any change of properties: but if the alcohlic solution is evaporated to dryness, the gluten is left as a transparent varnish.

It swells up and softens with acetic acid, forming a compound which is soluble in water and precipitable by nut galls. It unites also with the mineral acids; and these compounds, excepting that with sulphuric acid, disssolve readily in pure water, but are insoluble when there is an excess of acid. It is dissolved by a dilute solution of potash, apparently without being decomposed; for the gluten after having been thrown down by the mineral acids, retains its viscidity. In this state, however, it is combined with some of the acid. Ammonia and lime exert but little action upon gluten, when in the solid form; but when to a solution of gluten in an acid, caustic ammonia, or lime is poured drop by drop, a precipitate is formed which quickly disappears.

The combinations of gluten with the other bases are all insoluble in water, and are precipitated when a solution of the compound of potash and gluten is mixed with the earthy or metallic salts.

The alkaline carbonates do not dissolve gluten immediately. They precipitate it from its solution in the acids, and the more completely according as a greater quantity of the precipitate is added, and as the solution is more concentrated. The chloride of mercury forms an abundant white precipitate in acid or alkaline solutions saturated with gluten. In this case, the gluten combines with one portion of the salt, after the manner of many animal substances. Exposed to a strong heat, gluten yields, in addition to the usual inflammable gases, a thick fetid oil and carbonate of ammonia.

5. *Albumen.* This substance exists in all vegetables whose sap coagulates by heat. It is soluble in water, until it has been inspissated by heating, which renders it completely insoluble. On being dried, it becomes opake, and assumes a white, grey, brown or black colour.

It is insoluble in alcohol. The caustic alkalies dissolve it readily; it neutralizes their caustic taste, and is precipitated from its union with them, on the addition of an acid in great excess.

The solution of albumen may be rendered so acid as to redden the paper of turnsole without occasioning any precipitate, the

liquid simply becoming milky, and reassuming its transparency on being heated. By a very considerable excess of acid, however, the vegetable albumen is thrown down; and the precipitate is a chemical combination of albumen with the acid w hich i scarcely soluble in the acid liquor, but soluble in pure water.

The latter solution is easily precipitated by the acids, ferro-cyanate of potash, chloride of mercury and nut galls. When a solution of the potash completely saturated with albumen is mingled with a solution of any metallic or earthy salt, corresponding compounds of albumen with the bases are obtained. These compounds are nearly all insoluble.

Vegetable albumen is not dissolved by the alkaline carbonates, and after having been coagulated, it ceases to be soluble in caustic ammonia. If carbonate of ammonia is added to a saturated solution of albumen in potash, a part of the albumen is precipitated, but the precipitate is redissolved in a large quantity of water. Carbonate of ammonia precipitates it from its solution in the acids better than any other reagent; nevertheless it retains a certain portion of it.

Albumen and gluten, in consequence of their great resemblance to the white of an egg, and to the fibrin of animal fluids, have received the common name of vegeto-animal substances. They contain not only nitrogen, as is evinced by the evolution of ammonia from their destructive distillation, but they often contain sulphur and phosphorus. When left to themselves in the humid state, they undergo the putrid decomposition, attended by the disgusting odor of animal putrefaction, the disengagement of ammonia and the production of acetate of ammonia. At a certain stage of their decomposition, both when united and when separate they afford the odor of old cheese.

Gluten and Albumen, when aided by water and heat, exert jointly, and perhaps separately, a very remarkable action upon starch. Two parts of potato starch are mixed with four of cold water, gradually diluted with 20 parts of boiling water and blended with one part of dried and powdered gluten and albumen; the composition is exposed, during 8 hours, to a temperature of between 50 and 70° C. After about 2 hours it loses its consistence, and the reaction takes place rapidly, so that the liquor becomes very fluid, transparent and sugary. One part of the starch is transformed into gum, and another into sugar; the mixture not absorbing either of the gases of the air, but emitting a small quantity of carbonic acid gas.

According to Saussure, cold diluted alcohol, added to the mixture in a dry state, dissolves a quantity of Sugar, equal to 1-7th of the starch employed, and water removes from the residue a quantity of gum equal to one-fifth of the starch. The remainder consists of a mixture of starch not altered, and of gluten which

is acid, and has lost almost totally the property of reacting on the starch.

6. *Green Fecula.*—This is the Herbaceous matter of Dr. Higgins. It is the colouring matter of the leaves and stalk. Its prevailing hue is green, although other colours, as red and yellow, enter into its composition. It is precipitated from the sap of plants by lime water, barytes and strontian, and by the salts of these bases. The precipitates are of a yellowish green colour and insoluble in water. The colouring mattter is closely associated with a waxy or resinous substance, from which it has never been perfectly freed. The compound is bleached by exposure to the sun and by chlorine. The acids also destroy its colour. Caustic potash converts it into soap. It is soluble in alchohol and ether, and in fixed and volatile oils. When plants approach the period in which their fruit become perfect, the waxy matter assumes a yellowish colour.

7. *Lignin* constitutes the porous tissue by which the sap of plants is conducted from the root to the branches. It constitutes the skeleton of vegetables; and is what remains after a plant or a part of a plant has been treated with ether, alcohol, water, dilute acids and alkalies. Owing to its porous texture as well as its chemical affinity for colouring matter, it is frequently stained of some colour; especially in the dead plant. Concentrated sulphuric acid converts it into gum; and nitric acid, into oxalic acid. The concentrated solutions of alkalies dissolve it into a homogeneous mass, having an empyreumatic odor and a blackish colour, and containing acetic and oxalic acids.

(*To be continued.*)

Art. XXVI.—*Indian Corn.*

[FROM THE N. E. FARMER.]

Not only our friend Gorham Parsons, Esq. but several other very respectable cultivators have requested information relative to the methods of culture practised by those who have raised extraordinary crops of Indian corn. We shall, therefore, briefly state, so far as our means of information will permit, the difference between the course of culture pursued, by those who are accounted our best farmers, and those, who by dint of what may be called the "*New Husbandry*," have succeeded in obtaining the

prodigious crops, which seem to set our competition at defiance, and almost to destroy emulation by depriving competitors of the hope of equal success.

Mr. Parsons asks "what besides good, deep, and frequent ploughing, manuring in the hole with a large shovel full of good manure, or dividing the quantity of manure, spreading and ploughing in one-half, weeding early, ashing the corn at the two first weedings, and half hilling and hilling at the two last hoeings, first selecting the best of seed corn, and the kernels, five in number, placed carefully, forming a square, each kernel four inches apart, and one in the centre, is required to obtain one hundred bushels to the acre?" This is a very good epitome of the *old style* of cultivating corn. We will give brief notices of some of the requisites of the new modes of making the most of that plant.

And 1st. *The Soil and its Preparation.*—This should be a light loam, made very rich, by animal or vegetable manure, or both. Green sward well covered with long manure, completely inverted with the plough, harrowed and rolled, so as to lie flat, but not ploughed deep, are said to be requisite for large crops of corn. Ploughed in the fall if inclining to clay, in the spring if light and sandy, but at any rate do not disturb the sod, nor bring any part of it to the surface, at least till after your corn is harvested.

2d. *Seed and its Preparation.*—We believe it has been ascertained what kind of corn is generally most productive. From some experiments made by E. F. Woodward, of Newton, Mass. it appears that of three sorts, which he measured and shelled, the heaviest grain and the lightest cob was obtained from a "yellow corn of 12 rows" on an ear.* Further inquiries and experiments on this subject are very desirable.

It has been often stated that great advantage has been derived from selecting seed-corn from stalks, which had borne two or more ears. An article republished in the New-England Farmer, vol. x. p. 134, from the Hampshire Gazette, mentions a farmer, "who has selected his seed-corn in this way for three years past, and the result has exceeded his expectation. He states that it is not uncommon to find in his cornfield stalks with three, four, five, and sometimes six ears, and three of them fair, full grown, and fit for seed, and that too in hills containing four or five stalks. He says, I think my crop has been increased several bushels this year, by the experiment. I would suggest a mode of selecting seed to those who do not cut up corn by the roots. When they are picking corn, and find a stalk with two or more ears, let them tie the husks together, and the ears will be easily known at husking." This mode of selecting seed, roots, &c. to propagate from, was, we believe, first introduced by Mr. Benjamin Cooper, of Camden, N. J.†

* See N. E. Farmer, Vol. x. p. 331. † Ibid. Vol. xi. p. 273.

With regard to preparing the seed-corn for planting, the recipes are numerous, and too well known to require recapitulation, when addressing a scientific and experienced cultivator. Some, steeps are used for fertilizing, some to preserve against worms, and some for both purposes. The preparation used by Judge Buel may be found, New-England Farmer, vol. xi. p. 306. A writer for Goodsell's Genesee Farmer, with the signature W. J. W. recommends wetting seed corn with soft soap, and rolling it in plaster; and gives the details of an experiment, which proved the utility of this preparation. The benefits derived from soaking seed-corn in a solution of copperas have been often stated by writers for the New-England Farmer. Mr. J. Elsworth gave us a very satisfactory article on that subject, published in the New-England Farmer, vol. x. p. 331.

3d. *Manner of Planting.*—The principal improvement in raising this crop, introduced by modern husbandry, consists, we believe, in substituting drills of one, two or three rows for the usual mode of planting in hills, by which a greater crop is obtained, though the expense of culture is undoubtedly increased. This can not be better explained than by quoting from an excellent article written by Judge Buel, of Albany, originally published in the Genesee Farmer, and republished in the New-England Farmer, vol. xi. p. 305.

"The following table exhibits the difference in product of various methods of planting, and serves also to explain the manner in which large crops of this grain have been obtained. I have assumed in the estimate that each stock produces one ear of corn, and that the ears avarage one gill of shelled grain. Thus estimating the product low, for while I am penning this (October,) I find that my largest ears give two gills, and 100 fair ears half a bushel of shelled corn. The calculation is also predicated on the supposition that there is no deficiency in the number of stocks, a contingency pretty sure on my method of planting.*

	hills.	*bush.*	*qts.*
1. An acre of hills 4 feet apart, each way, will produce, - - - - - - -	2722	42	16
2. The same, 3 feet by 3 feet, - - -	4840	75	20
3. The same, 2 by 2½ feet, - - -	5808	93	28
4. The same in drills at 3 feet, plant 6 inches apart in the drill, - - - - - -	*stalks.* 29,040	113	*14*
5. The same in do. 2 rows in a drill, 6 inches apart, and the plants 9 inches, and 3 feet 9 inches, from centre of drills, thus:	30,971	120	31

* Planting an extra number of plants, and thinning them at the first or second hoeing.

	stalks.	*bush.*	*qts.*
6. The same in drills, 3 rows in a drill, as above, 3 feet from centres of drills, ...	43,560	170	5

"The fifth mode" Judge Buel states "I have tried. The ground was highly manured, the crop twice cleaned, and the entire acre gathered and weighed accurately the same day. The product in ears was 103 bushels, each 84lbs. net, and 65lbs. over. The last bushel was shelled and measured, which showed a product on the acre of 118 bushels, 10 quarts. I gathered at the rate of more than 100 bushels to the acre from four rods planted in the third method last summer—the results ascertained in the most accurate manner. Corn shrinks about 20 per cent. after it is cribbed. The 6th mode is the one by which the Messrs. Pratts of Madison county, obtained the prodigious crop of 170 bushels per acre. These gentlemen, I am told, are of opinion that the product of an acre may be increased to 200 bushels.

"The writer also observed, I am told the Messrs. Pratts, above alluded to, used seven bushels of seed to the acre, the plants being subsequently reduced to the requisite number."

From the above and other authorities, it appears that the requisites for obtaining more than 100 bushels of corn to an acre are a proper soil, a grass sward, well manured, ploughed but once, fairly inverted, harrowed and rolled,—seed from stalks producing more than one ear, prepared by steeping in some liquid which fertilizes and preserves it from worms, planted in the right season, in drills, as above described, and well hoed, without much hilling. It is likewise advised to have the rows or drills run north and south, thus giving the plants a more advantageous exposure to the rays of of the sun.

Art. XXVII.—*Jerusalem Artichoke; by* D. L.

[FROM THE NEW-YORK FARMER.]

Although this vegetable is generally known in this country, still it is questionable if a full and satisfactory experiment was ever made. We make the following extract:

"I was determined to prove whether or not they could be cultivated to greater advantage than the potato, as *food for cattle.*

One sack was consumed by a young calf at hand; it ate them with avidity, and improved on them. I took the other two sacks and planted them in the midst of a five acre piece of potatoes. I set them whole without cutting, measuring correctly an eighth part of an acre; the produce was in proportion to six hundred and forty bushels per acre; the potatoes three hundred and twenty-seven bushels. The following year, the memorable one of 1826, I planted half an acre on a piece of thin gravel, old tillage land, in its regular cousse of preparation for a vegetable crop after wheat; they maintained their verdure through that extraordinary dry summer, and produce one hundred and fifty bushels; but the potatoes by the side of them were completely set fast; they never formed a bulb. The year following I set an acre on part of the same kind of soil, but of better quality; it produced five hundred and seventy bushels *without any dung.* An half acre on the same land, with the usual quantity of dung for turnips, produced two hundred and ninety bushels (a bad compensation for eight loads of excellent dung.) This present season, an acre on the same land (part of my turnip fallows) produced five hundred and seventy-six bushels; but the wet state of the soil when taken up, and being a vegetable of uneven surface, which causes the soil to adhere to it more than to a potato, renders it difficult to come at the exact quantity. From an experiment I made of washing a sack, I can safely assert, I have five hundred and thirty bushels of clean roots; whilst the vegetables on our flat gravels do not equal this by full fifty per cent. in value, except the potato, which produced three hundred and eight bushels on the same soil. I could never raise more in favourable seasons.

"The cultivation of the artichoke is the same as of the potato, except that it requires to be set early—not later than March; if laid above ground all winter, it is proof against the severest frost. When once cleaned, no weed can live in its dense shade; horses, beasts, and sheep, consume it with avidity; pigs prefer a potato to it in its raw state, but prefer the artichoke when boiled or steamed. It attracts the game in a most extraordinary way; they resort to its shade in autumn; it forms one of the finest covers in nature. We are so fortunate as to have but little game in our lordship; I do not recollect ever having seen even a Swedish turnip bitten by a hare or rabbit, notwithstanding they will consume the artichokes left by the men in securing them.

"If potatoes can be profitably cultivated as food for cattle, compared with Swedish turnips, mangold wurzel, the sugar beet, &c. (which I much doubt,) the artichoke is vastly superior to them. The expense of culture is no more; it is not liable to be injured by frost; can be taken up at pleasure; it produces at least thirty per cent. more, and on poor land fully fifty per cent.; *is far more nutritious*, and leaves the land perfectly clean. The only objection that can be urged against their cultivation for cattle in compe-

tition with potatoes, is that they require more in taking them up. The frost not acting upon them so as to destroy vegetation; what are missed will, of course, grow amongst the succeeding crop, but I have found very little inconvenience in this respect. D. L."

Art. XXVIII.—*Rot in Cotton.*

[FROM THE LOUISIANA REGISTER.]

"Parish of East Baton Rouge, Jan. 1834.

Mr. Alexander,—I observe in No. 31 of your Register, that a writer in the "*Southern Agriculturist*," has offered a solution to the often agitated inquiry "what is the cause of the rot in cotton?" I beg leave to differ from that writer in opinion. I believe it is caused by an insect perforating the boll. Some few years since my attention was drawn to this subject, and I became satisfied that the rot was caused by an *ant;* in coming up to this conclusion, I observed the bolls of the Tennessee, Alvarado, and the Creole black-seed cotton, growing in the same field. Each was equally perforated; but the hull of the Tennessee, which was three-fourths thicker than the Creole, could not be penetrated by the ant. By taking the bolls of each kind of cotton, and with a knife paring off the hull, or covering of the boll, the depth that the bill of the ant had penetrated might be easily traced. The hull of the Tennessee cotton, of the first year's growth, would not be perforated more than half way through; the Alvarado was not as thick, but sufficiently so to prevent injury; while the thinness of the Creole admitted the bill of the ant to the seed.

It is in wet seasons, when the growth of cotton is luxuriant, and fermentation easily excited, that we witness the greatest devastation. It is probable the ant may be found in all cotton growing countries, and equally abundant every year: but from some local cause, either from the peculiarity of the season, or quality and exposure of the soil upon which the plant is situated, the hull is more or less thick. It must be owing principally to the place or climate, as it is observed, Tennessee or Alvarado after being planted here a few years, are equally liable to the rot. On observing the thickness of the covering of the bolls of the Tennessee cotton of the first, second, and third year's growth, I found in the latter year the hull was as thin as that of the Creole.

Art. XXIX.—*Gama Grass; by* Wm. B. Meares.

Wilmington, N. C. Feb. 1834.

Mr. Hitchcock,—Dear Sir,—So many inquiries have been of me, as to the nature, mode of culture, &c. &c. of the gama grass, I am induced to communicate, through the medium of your paper, such knowledge as I have on the subject.

The grass is perennial. Its most valuable qualities will be as hay, and when used green, for soiling. I have not yet made the experiment, but doubt whether it will answer for pasturage. This doubt is produced, not only by the form of the grass, but by the fact, that it is never found growing spontaneously where cattle have uncontrolled access.

The soils most suitable to its growth, are limestone, alluvial bottom, and rich clay loams. But its great excellence is, it will grow and *produce abundantly* in *any soil*, (dry enough for Indian corn,) *naturally rich*, or *made so.*

He who cultivates it on *poor* ground, with the hope of large crops, will certainly be disappointed.

It produces very little if any seed, the first year, nor does it reach its full maturity and best product, until the second or third year.

It is very easily transplanted. Where there is only a small supply, the quantity (for another year) may be greatly increased by taking up the roots in the fall or winter, and dividing or transplanting them. Each root will furnish from five to twenty, and sometimes fifty plants.

The seed should be planted from November to January, and covered from one to two inches deep. They will not vegetate until warm weather.

When the roots or seed are planted to remain permanently, I think the best manner is to set them in drills three feet apart and place them two feet apart in the drill. In two years the drills will be filled up, and there will be space for manuring between them. I take it for granted, the immense yield of this grass will produce exhaustion of the fertility of the soil; and unless manured, the product must lessen.

If not necessary, it is at ony rate better, to cultivate it the first year, and keep it clear of weeds and other grasses: after that, I think it will root out any competitor.

It may be found in every State of the Union from Virginia to Missouri, (inclusive,) south and west; and I have been surprised by inquiries after it, from places where it abounded in the neighbourhood. Yours, respectfully,

WM. B. MEARES.

PART III.

MISCELLANEOUS INTELLIGENCE.

Keep separate Pastures for Horses and Cows.—One of our subscribers in the State of Pennsylvania, whose communications we always receive with pleasure, has furnished the following remarks:

"We became satisfied many years ago that sheep and milch cows ought not to run together in the same pasture; and we have kept them separate ever since, evidently to the increase of our milk and butter. The last season, I kept my horses and cows in separate pastures, to the very visible benefit of both. They had a change of pasture as usual, but were not suffered to run on the same grass. All appeared to be in better than common condition, and the grass was of finer growth when compared with other similar fields in the neighbourhood. I am satisfied that farmers suffer much loss by not attending to these *small matters*."—*Gen. Far.*

Apple Trees.—A gentleman in Essex, England, having in his orchard many old supposed worn out apple trees, which produced fruit scarcely larger than a walnut, last winter took fresh made lime from the kiln, slacked it with water, (without allowing time for its caustic quality being injured by imbibing fixed air) well dressed the trees, applying the lime with a brush. The result was, that the insects and moss were completely destroyed, the outer rind fell off, and a new, smooth, clear one formed; and the trees, although some twenty years old, have now a moist healthy appearance. The same treatment may be extended to other fruit bearing trees, and probably with a similar beneficial result.

Sulphur in Trees.—Messrs. L. Tucker & Co.—I have observed some notices in your paper recommending the boring of fruit trees, and the application of sulphur, with a view to their renovation. I am induced to furnish you with an experiment that has fallen within my observation relative to the same;—about ten years ago, two large fine pear trees, on the place on which I live, had been noticed to have been extensively affected with what has been called the "fire blight," and otherwise on the decline. An augur of about three-quarters of an inch was bored into the trunk of one of them, the hole filled with partially pounded roll brimstone, and plugged up again. The other tree was left to take its natural course, and in the course of three or four years died. The tree which had been so bored revived, and has borne fruit abundantly since. Last year it was split by a storm of wind, being old and much decayed, by which the perforation was opened to view, and discovered the brimstone apparently in the same state as when it was placed there—thereby inducing the opinion, that the tree may have been benefited by the boring, but not from the application of the sulphur, because the same could not have been absorbed by the tree. D. S.

Allegany County, (Penn.) Jan. 22, 1834.—*Gen. Far.*

Preserved Tomatoes.—Dining a few days at Mr. Pardoe's, inn-keeper, three miles below Lewisburgh bridge, my attention was called to notice a new kind of preserve, prepared by the landlady from the common tomato. Its flavour

was remarkably rich and fine, so much so, that I was induced to inquire into the particulars. It is a discovery of her own The tomatoes are taken when nearly ripe, and prepared in the usual manner of other preserves, with sugar and molasses.—*Northumberland, (Pa.) Public Aspect.*

To Dairy Women.—To prevent that rancid, nauseous flavour, which is too often prevalent in cheese, even when made of the richest milk, and which otherwise would be delicious, salt the milk as soon as it is taken from the cows. I mean the evening's milk, which is kept in pans during the night, in order to be mixed with the new morning's milk. The quantity of salt to be used on this occasion, is about a table spoonful to each gallon of milk, and is generally sprinkled on the bottom of the pan, and the milk poured upon the salt, and they soon become incorporated. This early salting has enabled many dairy women, whose cheese was before always hoven and detestably rank, now to produce excellent well flavoured cheese, and on farms that had been pronounced totally unfit for the dairy system. This small portion of salt, various good effects are attributed by those who use it; they say, it prevents the milk from souring in the hottest nights, that it encourages coagulation, and very much promotes the separation of the curd from the whey, which is a great saving. All dairy women ought also to know that it is a false idea, and a loss instead of a gain to the proprietor, to rob cheese of a particle of butter; and for these two reasons, because a pint of cream will produce more than trebble the quantity of curd, that a pint of skimmed milk will give; and because a cheese with all the butter left in it, will lose very little of its weight by keeping, whereas that from which the butter has been avariciously taken, will lose one-third of its original weight in twelve months.—*Agricultural Repository,* 1800.

Butter.—To the Editor of the Farmer and Mechanic,—Sir,—The difficulty and labour frequently attending the churning of butter, led me to try a variety of experiments to ascertain if a method could be discovered for making buter come quicker than the usual mode. After trying several things, I found that by adding a table spoonful of good vinegar to four gallons of cream, when put into the churn, I obtained butter in from seven to eight minutes.

If this information will be of any service to your subscribers, you are at liberty to publish it. Yours, &c. B.

A good pickle for Beef and Pork, called the "Knickerboker Pickle."—The following receipt for making pickle for beef and pork is strongly recommended to the adoption of those who pickle beef and pork for family use. Persons in the trade who will adopt it will find a ready sale. It has been used by many families in this and always approved. We do not hesitate to assert that there is no pickle in use to be compared with it. Could this receipt be generally adopted, our pickle beef and pork would have certain preference in foreign markets.

Take 6 gallons of water,	3 oz. salt petre,
9 lbs. salt, coarse and fine mixed,	1 oz. pearl-ash,
3 lbs. Brown Sugar,	1 gallon molasses.

In making a larger or smaller quantity of pickle, the above proportions are to be observed. Boil and skim these ingredients well, and when cold put them over the beef or pork.

☞ We have heretofore published the substance of the above, and its utility has been established by experience in this vicinity. We give it another insertion for the benefit of those who have either overlooked, or had no opportunity to look over, or some how never attentively looked at our former edition of the receipt.—*Editor N. E. Far.*

Saving Bacon from Bugs and Worms.—I never wish to try ashes again, it kills the outside and is worse to wash off by far than any thing yet tried. Shelled corn is good and so is wheat bran, but I prefer letting it hang in the house

all the time, and when damp or wet weather, make good fires under it, the richer the fire the better, it will wash very easy—some might think it a ruination to the bacon, and make it leak—all a mistake, not to the weight of three bugs out of a middling.

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Gestation.—The period of gestation, or the length of time, which different animals go with young, should be known by every farmer: that the season of copulation with his different kinds of stock, may be so regulated, as to have them bring forth their young, under the most favourable circumstances.

Mares go a few days over eleven months, with foal.
Cows go about forty weeks, or ten lunar months.
Ewes bring forth at the end of five months.
Goats, at four and a half months.
Sows at four months.

The term of incubation, or time which different fowls set upon their eggs, before hatching, is as follows:

Swan sets six weeks.
Turkey sets thirty days.
Goose, from twenty-seven to thirty days.
Duck, from twenty-seven to thirty days.
Hens, twenty-one days.
Pigeons or Doves, fifteen days.—*Gen. Far.*

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Myrtle Wax.—A gentleman, who writes to the editor from Baltimore wishes to know how the wax obtained from the myrtle-shrub *Myrica Cerifera* can be bleached? We have no knowledge on this subject derived either from observation or experience, but find the following directions for bleaching *Bees-wax* in a collection of receipts, which we have generally found to be correct.

Melt your wax, and while hot throw it into cold water to reduce it into little bits, or spread it out into very thin leaves, and lay it out to the air, night and day, on linen cloths, then melt it over again, and expose it as before: repeat this till the sun and dew have bleached; then, for the last time, melt it in a kettle, and cast it with a ladle on a table covered over with little round hollows in the form of the cakes sold by the apothecaries; but first wet your moulds with cold water, that the wax be the easier got out; lastly, lay them out in the air for two days and two nights, to make it more transparent and drier.

Although these directions are for bleaching *bees-wax*, they may, perhaps, answer for *myrtle-wax*.

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Post Planted Top-end Downwards.—The third volume of the Memoirs of the Philadelphia Society for promoting agriculture, contains an account of some *posts planted top-end downwards*, which were more durable than some others which were set in the common mode; and understanding that one of our friends had successfully repeated the experiment, we wrote to him for the particulars. The following is his statement:—

"The inverted posts were all sawed from two trees, the logs having had but little taper, and they were sawed wedge-shaped, consequently *one-half* were cut each way—that is, the top-ends of one-half were larger, and we set the larger end in the ground. This was done in the fall of 1817 and the spring of 1818. There were about sixty pannels or posts altogether, which were taken up in 1830, '31, '32. From my bear recollection about one-third of those that stood butt-end down, were in *tolerable preservation*, while of those inverted about two-thirds were in *better preservation* than the one-third just referred to; and a number of them, except half an inch on the outside next the earth, were quite sound, and decidedly in better condition than any of the former kind."

From the account given in the Memoirs we learn that the inverted posts were forked or knotty; and these are the most durable parts of timber, we thought rather lightly of the discovery. The evidence which we now present to our readers, however, is more pointed than any thing else that we have

seen on the subject; yet we do not understand why one-third of the inverted posts, and two-thirds of the others should be more decayed than the rest; and we should be better satisfied with an experiment on posts sawed from one single log, or *cut*, of straight-grained timber.

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Protection of Birds.—The following notice to gunners and hunters, signed by nineteen individuals, appeared in a late number of the Germantown Telegraph.

"We, the subscribers, of Lower Merion township, Montgomery County, viewing with concern the astonishing increase of insects, and the immense damage done to our crops and fruit, for several years past, and believing the cause to be principally owing to the killing of birds, do most respectfully admonish all persons to abstain from shooting them, or destroying their nests or eggs; and, for ourselves, we do absolutely forbid any person or persons trespassing on our places, breaking our fences, hunting or firing a gun on our respective lands, or with dogs of any species; therefore, any person or persons entering on our premises, contrary to this notice, must expect to be dealt with according to law."

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Examination of a Horses' eye.—People in general turn a horse's head to a bright light to examine his eye. You can know very little, by this method, what sort of an eye a horse has, unless it be a very defective one. You must examine the eye first, when the horse stands with the head to the manger. Look carefully at the pupil of the eye in a horse; it is of an oblong form: carry the size of a pupil in your mind, and then turn the horse about, bring him to a light; if the pupil of the eye contracts, appears much smaller than it was in the darker light, then you may be sure the horse has a strong good eye; but, provided the pupil remains nearly of the same size as it appeared in the darker light, the horse has a weak eye; therefore have nothing to do with him. There are contracting and dilating muscles in the eye which will plainly show you in what state the eye is, whether it be a strong or weak one.

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Dunging in the Hill.—Dunging in the hill appears to us an injudicious method of applying manure, even when the quantity is small. It gives to the plant a luxuriant start, provided the manure is rotted, but two often proves of little value afterwards. It is mostly used in this way upon corn. If the manure is long, or dry, and dry weather ensues, it firefangs or does not rot, and the crop is little benefited; and for the next crop it benefits only parts of the soil where the corn has grown. The small fibres of the roots are the mouths of the plants through which the food passes to the stalk. If we examine the roots of corn we shall perceive that they extend as far in the ground as the stalks do above. Hence it will be perceived, that the dung, if placed in the hill, cannot benefit the roots, nor materially the plant, after they have extended beyond the circle where it is deposited. Whereas if it is spread and buried in the soil, it benefits them in their whole extent; there probably not being a square inch of ground in the whole field into which the roots do not penetrate in search of food. We would thank some of our readers to make an experiment, and communicate to us the result. Let half an acre have ten loads in the whole, and another half acre ten loads spread broadcast, and note the product of each in corn and the crop which follows it.—*Gen. Far.*

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Improvement in the mode of raising annual Flower Seeds.—After sowing the patch seeds, and covering it with fine moist soil, place a garden-pot inversely over it, until the seeds have struck root; then raise the pot up two or three inches, keeping it thus supported for a few days, and then remove it entirely. The pot not only keeps the soil moist, but by the sun heating the pot, the seeds come up much more quickly than otherwise they would do, in consequence of which the seeds need not be sown so early by a fortnight or upwards. The young plants are therefore less exposed to injury from cold or late spring frosts. Hollow tiles, instead of pots, answer equally well, except where mice are, they have access to the ends.—*Gar. Mag.*